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Charlestown Navy Yard, 1890-1973

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Frederick R. Black

The Boston Navy Yard in the 1930s.

CULTURAL RESOURCES MANAGEMENT STUDY NO. 20

Volume I of II

1988

Charlestown Navy Yard, 1890-1973

by
Frederick R. Black
Professor of History
C. W. Post Campus, Long Island University

CULTURAL RESOURCES MANAGEMENT STUDY NO. 20

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Division of Cultural Resources
North Atlantic Regional Office
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Volume I of II

Boston National Historical Park
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Boston, Massachusetts

1988

This report is the third part of a series of historic resource studies covering the history of the Charlestown Navy Yard (Boston Navy Yard/ Boston Naval Shipyard) from 1800 to 1973. . The first part, covering the years 1800 to 1842, was written by Edwin C. Bearss and published in 1984. The second part, covering the years 1842 to 1890, is under preparation.

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PREFACE

In April 1973, the Department of Defense announced the closing of the then 173-year-old facility known successively as the Charlestown Navy Yard, the Boston Navy Yard, and the Boston Naval Shipyard. Except for the overhaul of the historic frigate Constitution, all industrial operations ceased as of December 31, 1973, and the Navy officially and formally disestablished the yard in ceremonies on July 1, 1974. The following October, Congress created the Boston National Historical Park, under the management of the National Park Service and consisting of numerous historic sites, including the western third of the Boston Navy Yard.

To aid in its interpretation, the National Park Service made plans for a history of the yard, to be divided into three chronological segments: 1800, the yard's beginning, to the early 1840s; the 1840s to 1910; and 1910 to the closing. Edwin C. Bearss, formerly Historian, Denver Service Center, and now Chief Historian, National Park Service, undertook the research and writing of the first two segments. In October 1984, the National Park Service published his study covering the years 1800 to 1842.[1] Meanwhile, a change occurred and the decision made to establish 1890 as the terminal date of his second endeavor and as the starting point for my part of the undertaking. Mr. Bearss

1. Edwin C. Bearss, Charlestown Navy Yard, 1800-1842 (2 vols., n.p.: National Park Service, 1984).

had explored the years 1890 to 1910, and he graciously provided me with copies of documents and his draft notes on that period. He shares in whatever merit is found in the present volume's first three chapters.

This study describes the history of the Boston Navy Yard as a military and industrial institution since 1890. It gives attention to the yard's administration, physical plant, civilian work force, and productive activities. Those activities essentially consisted of various types of ship repairs, occasional ship construction, and manufacturing of equipment required by the fleet. Navy yards generally reveal their full capabilities only in times of hostilities, and particular emphasis is given to the yard during the wars which punctuate the American past since the late nineteenth century. Another topic of special interest is the circumstances of the closing of the yard in 1973.

The decision to assign 1890 as the starting point for this volume is a logical one, since that date roughly coincides with important turning points for the Boston Navy Yard, the Navy, and the United States. In the twenty years after the Civil War, the Navy steadily declined, shrinking in size and capability. That decline resulted in a retrogression for navy yards, the Boston facility discontinuing its ship repair function in the 1880s. The nation displayed preoccupation with internal developments and had little interest in extending its political or economic influence abroad, an extension which would have required an

active, sea-going fleet. Change came in 1883, when Congress authorized construction of a number of modern ships, the beginning of the so-called "New Navy." As those ships actually came into being, work at navy yards revived, including activity at Boston. Moreover, the mission of the Navy enlarged, as the nation sought a more vigorous prosecution of its interests overseas. Consequently, the Boston Navy Yard, from 1890 to 1973, served the modern steam-powered, steel-hulled, deep-water Navy.

This study, then, is a descriptive narrative of the career of the Boston Navy Yard in its modern era. Certain themes are employed primarily to explain conditions and changes in the facility. Most obviously, the history of the shipyard at Boston reflects developments in the larger institution of which it was a part, the United States Navy. The thematic axiom that as goes the Navy, so goes the Boston Navy Yard applies in most, but not in all instances. For example, the Navy still exists, but not the Boston Navy Yard. Moreover, navy yards tended to specialize in certain types of activity and ship work. The history of the Boston facility more or less faithfully mirrors the rise of the destroyer as the workhorse of the Navy. On the other hand, the post-World War II advent of nuclear submarines was only indirectly manifest at Boston, the yard specializing in destroyers and not submarines. In addition, navy yards as military institutions have unique characteristics, arising from the fact that they employ and are dependent upon large numbers of

civilian workmen. Congressmen sometimes regard the needs and interests of those workers -- and voters -- as rivaling the needs and interests of the fleet and of the Navy. Also, because of their sizeable labor forces, navy yards occasionally have been used by the national government to effect changes in the general economic conditions. Which is to say, yards have not been simply military entities. They also have had political and economic dimensions.

Nevertheless, an understanding of the fleet and of the Navy hierarchy in Washington aids in comprehending developments in the yard. The organization of the Department of the Navy, especially in the nineteenth century and early decades of the twentieth, was a determinant in the administrative structure of the Navy's industrial facilities. The expansion of the fleet, the appearance of larger warships, and changes in propulsion, armament, and other equipment had an impact on the development of navy yard plants, as the yards sought to stay abreast of advances in ship design and naval technology.

A researcher into the history of a navy yard encounters several problems. First of all, he sets forth in a waters largely uncharted. Navy yards have been in existence since 1800, and at one time or another there have been approximately twelve such facilities. However, collectively and individually they have commanded little attention from historians. An account of the yard at Mare Island, California, from 1854 to 1954, is the only

conventionally published book-length history of a yard known to exist. Produced to celebrate the centennial of Mare Island, it was written by a Navy officer stationed at the facility. In many respects commendable, the Mare Island study can only hint at patterns that might appear in other yards.[2]

Another problem arises because of the quantity of the documentation. One inventory of the National Archives' collection of records of the Boston Navy Yard indicates that documents for the period 1890 to 1942 occupy shelf space totaling roughly 900 feet.[3] How many pages that works out to be is largely guesswork, but a conservative estimate would be at least one million. Fortunately, there are several guides to the collection to assist in the effort to identify the more promising items. However, the fact remains that the amount of material for part of the history of the yard since 1890 is staggering. On the other hand, after 1960 the official records available to the researcher become quite sparse, the bulk of the documents not having been transferred to the National Archives or not left in the yard when it was taken over by the National Park Service.

The superabundance of source material for one segment of the Boston Navy Yard's modern career and the dearth of documentation

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2. Arnold S. Lott. A Long Line of Ships: Mare Island's Century of Naval Activity in California (Annapolis: United States Naval Institute, 1954).

3. Henry Schwartz and Lee Saegesser, Preliminary Inventory of the Textual Records of Naval Districts and Shore Establishments (Record Group 181) (Washington, D.C.: National Archives, 1966), pp. 8-16.

for the remainder produce similar results, a somewhat impressionistic reconstruction of the facility's history from 1890 to 1973. Hopefully, the documents which have been consulted and the conditions, incidents, and developments evidenced in them give an accurate and relatively thorough understanding of the activities and course of the yard since the late nineteenth century.

The records of the Boston Navy Yard are included in National Archives Record Group 181, Records of Naval Districts and Shore Establishments. That part of the record group consisting of the papers of the Boston yard are now deposited in the Federal Archives and Records Center, Waltham, Massachusetts. In this study, the Waltham collection is cited as "181," followed by the number of the particular entry and by other identifying information. Especially for the years beginning in 1909, the group is arranged and boxed chronologically by year. In the citations in this report, the box number is included, but not the year, unless it differs from the date of the particular document, the document has no date, or some other condition exists which might create confusion about the year of the box in which the document is contained.

The other major depository for material on the Boston Navy Yard is the Office of the Curator, Boston National Historical Park. Documents in that collection are designated "BNHP," followed by the record group (RG) number and the series number.

The seven maps of the Boston yard in this report are half-size reproductions of blueprints contained in the collection of

the Boston National Historical Park.

This report could not have been completed without the assistance and cooperation of a number of individuals, among them members of the National Park Service. Part of my obligation to Mr. Edwin C. Bearss has already been noted. In addition to his aid in researching the years 1890 to 1910, he made editorial corrections and helpful comments on a draft version of this report. Paul O. Weinbaum, Park Historian, Boston Historical National Park, provided useful suggestions about the same draft, furnished the author with copies of important items in his office, and supplied reproductions of the maps of the yard. Others at the park who have my gratitude are Curators Peter Steele and Arsen Charles and Historian Technician Margaret Micholet. For his understanding and patience, I once again have a debt to Dwight Pitcaithley, Regional Historian and project officer for this undertaking.

Stanley P. Tozeski of the Federal Archives and Records Center, Waltham, Massachusetts, proved unfailing in his cooperation during the many days I spent plodding through the records at that depository. I appreciate his assistance as well as that of other members of the center's staff.

Thanks is due to the Commander, Naval Sea Systems Command, for permission to have access to the unclassified parts of Record Group 181 at Waltham still in the control of the Navy. I am grateful to the Still Photo Branch, Office of Information, Department of the Navy, for copies of the photographs contained in this report. Permission has been granted to utilize all photographs, including those stamped: "Official Photograph. Not

to be Released for Publication."

It is a pleasure to acknowledge the many courtesies and the valuable services rendered me by Masako Yukawa and Iris Irwin, Government Documents Section, B. Davis Schwartz Memorial Library, C. W. Post Center, Long Island University.

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Chapter I

THE EIGHTEEN-NINETIES AND THE REVIVAL OF THE YARD

The "Splendid Little War" with Spain at the end of the 1890s marked the revitalization of the Boston Navy Yard and its transition from a post-Civil War facility to a twentieth-century navy yard. More important than the war in effecting this transition was the beginnings of the "New Navy" in 1883, when Congress embarked on a program of building modern, steel-hulled warships. However, the full impact of that construction program on the yard was delayed. Indeed, since the legislation imposed limitations on the cost of repair of existing ships, the immediate result was to further reduce activity at Boston. In 1890, the facility was barely functioning as a bona fide navy yard. Certainly it lacked a capability for significant repairs on the Navy's newest vessels.

The Boston Navy Yard reflected the general post-Civil War decline suffered by the United States Navy. However, whereas the fleet began to improve because of the new construction authorized in 1883, the yard had to wait a number of years before a reversal. Several of the nation's navy yards felt the brunt of a retrenchment program in the 1880s instituted by Congress and carried out by the Secretary of the Navy. Statistics had been compiled, revealing the inefficiency and waste at naval repair and construction facilities. In fiscal year 1882, for example, the navy yards collectively had employed 3800 mechanics and laborers and 650 foremen, clerks, and other workers at an annual rate of more than $3,000,000. During that period, the only work

in progress on ships of war in all of the yards was the repair of six vessels.[1]

In early 1882, a congressional committee reported a bill to close the Boston Navy Yard. This produced outcries from newspapers and the citizens of Charlestown, who held meetings to protest the proposed sale. One such meeting occurred on April 19. Several speakers advanced a number of theories as to the motivations of the congressional committee. One view held that the bill resulted from the maneuverings of the champions of the Portsmouth Navy Yard, which would escalate in importance with the demise of the other major New England yard. Two speakers held the bill's backers aimed at elimination of "the disgraceful patronage" associated with the Boston yard, the system of "yard politics," wherein politicians interfered with the hiring and firing of yard employees. Neither speaker refuted the charge, but both held the remedy was to get rid of the politics and patronage, not elimination of the yard. The Charlestown meeting of April 19 adopted resolutions against the congressional bill and appointed a committee to voice its views in Washington.[2] The effects of this and other rallies are unknown. The bill proceeded no further, and a different fate awaited the yard.

An act of Congress in August 1882 directed the Secretary of the Navy, under certain circumstances, "to suspend work at those yards where he finds it can best be disposed with" and ordered

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1. Secretary of the Navy, Circular Letter, Jun. 23, 1883, 181-38, Box 1.

2. Boston Daily Globe, Apr. 19, 1882; Boston Evening Transcript, Mar. 31, 1882, both in 181-83.

that, at those yards, "only such officers and employees shall be retained as are necessary to preserve and take care of the property of the Government." In the following year, the Secretary ordered work suspended in the yards at Pensacola, League Island, New London, and Boston. "At Boston, however, work in the ropewalk and sailmaker's department will continue." The order restricted Portsmouth to the repair only of wooden ships and severely curtailed activity in the Washington yard.[3] Thus, only the yards at Brooklyn, Norfolk, and Mare Island retained functions as genuine navy yards.

In December 1886, Secretary William C. Whitney further reduced the functions of the Boston yard's Departments of Construction and Repair, Yards and Docks, and Steam Engineering, when he ordered that, as of February 1, 1887, the facility would be used "as a permanent, general manufacturing yard for articles of equipment." To accomplish this change, the Secretary directed that all shops, buildings, tools, and appliances then in the custody of other departments be turned over to the Equipment Officer. Machines, tools, and items not required by the Department of Equipment were to be transferred to other yards and stations or otherwise disposed of. Although the order never achieved full implementation, it had the effect of closing the Boston yard as a repair facility.[4]

A newspaper article in 1897, recalling the state of the yard

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3. Secretary of the Navy, Circular Letter, June 23, 1883.

4. General Order No. 356, Dec. 12, 1886, 181-47, Box 2, vol. for Oct. 15, 1883-Aug. 16, 1893, p. 121. For newspaper reaction to this order, see Boston Sunday Record, Jan. 9, 1887, 181-83.

in the previous decade, presented a forlorn picture:

> Hundreds of thousands of dollars worth of machinery was given a coat of white lead and abandoned....When the plant was running at full capacity, there were times when two or three or four thousand men worked in the shops and shiphouses and in the dock. After the edict of inactivity went into effect, the force of workmen dropped to 200 or something like that -- so few men that they were lost to sight in the big buildings....Then began the lamentable era of the Boston Navy Yard, when it...became a silent and tristful monument.

Commenting on conditions in 1897, the newspaper noted that "new work has come to the yard so gradually and quietly that it has caused no great stir...."[5] Indeed, at that time, the Boston yard was reemerging as an important Navy installation, and the "old," nineteenth-century yard was giving way to a "new," twentieth-century facility.

A NINETEENTH-CENTURY YARD ADMINISTRATION

The administrative structure of the Boston Navy Yard reflected the organization of the Department of the Navy in Washington. In 1842, Congress replaced the Board of Navy Commissioners with five bureaus. From the perspective of navy yards, the most important of the new agencies were the Bureau of Yards and Docks, which managed the yards, and the Bureau of Construction, Equipment and Repair, responsible for building and repairing ships. Legislation passed in 1862 increased the number of bureaus to eight: (1) Yards and Docks; (2) Equipment and Recruiting; (3) Navigation; (4) Ordnance; (5) Construction and Repair; (6) Steam Engineering; (7) Provisions and Clothing; and

5. Boston Sunday Herald, Oct. 3, 1897, 181-83.

(8) Medicine and Surgery. An important aspect of the 1862 change was replacing the former Bureau of Construction, Equipment and Repair with three separate bureaus. Each of the eight bureaus created in 1862 was autonomous, its chief responsible to the Secretary of the Navy. Congress established the bureaus, but the Secretary determined their jurisdictional limits or cognizance.[6] In its annual naval appropriations bills, Congress spelled out the cognizance of the several bureaus in language used by the Secretary, although occasionally the lawmakers further delineated the boundaries between bureaus.

In 1842, when the bureau system was first adopted, the Bureau of Yards and Docks gained supervision of navy yards. However, the other bureaus had significant interests in the yards, since work performed there came under their cognizance. In 1868, the Secretary extended the bureau system to the organization and administration of navy yards. This resulted in the establishment at the larger yards of departments representing and responsible to the bureaus in Washington.

The independence of each bureau from other bureaus and thus of each yard department from other departments in the same yard was encouraged by congressional enactments, especially by separate appropriations, and by orders from the Secretary of the Navy. Such orders as those of June 25, 1889, defined the cognizance of each bureau and assigned to all, except Navigation, sole authority in a number of important areas. Each "shall

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6. Julius Augustus Furer, Administrative History of the Navy Department in World War II (Washington: GPO, 1959), pp. 198-9, 203.

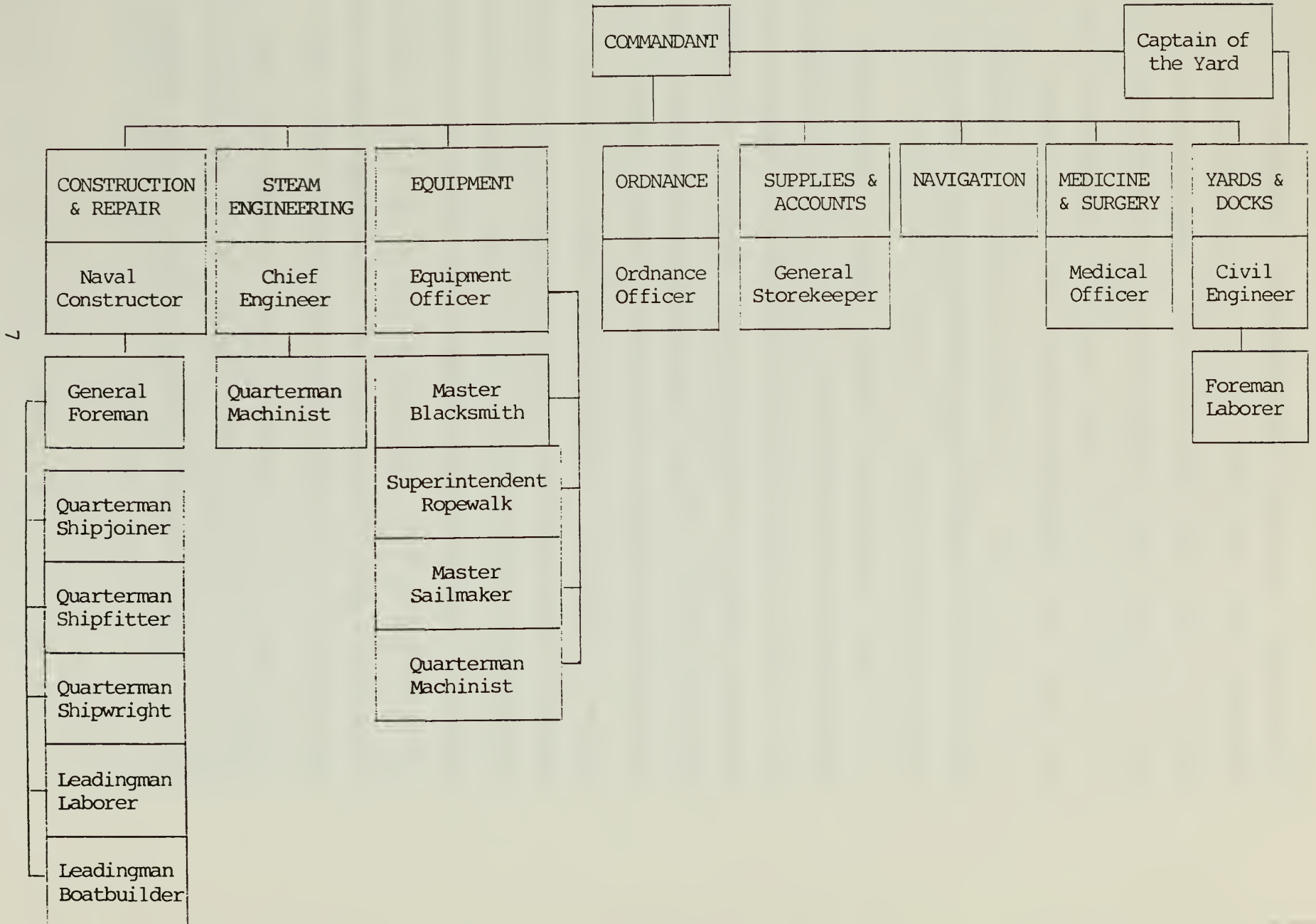
superintend all work done under it." Each "shall have under its sole control the pay, organization, mustering, under the regulations, and detailing of the labor," including draftsmen, master workmen and laborers, "paid from its funds, and connected with it and used entirely for its purposes." Most significantly, each bureau "shall estimate for and pay from its own funds the cost necessary to carry out its duties...."[7]

In 1890, the organization of the Boston Navy Yard consisted principally of eight departments and the offices of the commandant and the captain of the yard. The yard also included the Marine Corps detachment, the Navy prison, and the receiving ship Wabash. A number of off-yard officers, offices, and facilities were administratively identified with the yard.

The most important units in the Boston Navy Yard were the departments. The bureau system, as created and sustained by Congress and extended to shore establishments, resulted in largely autonomous, independent departments in the navy yards. At the Boston yard in 1890, the major departments were Yards and Docks; Equipment; Construction and Repair; Steam Engineering; and Provisions and Clothing. The Departments of Ordnance, Navigation, and Medicine were small. Each of the departments, except Navigation, had its own head, a commissioned naval officer, and each of the major ones had their own shops, tools, and machinery; their own clerical and labor forces; their own payroll, fuel, and power supply. Each had control of the uses of and arrangements within its own buildings. In short, the

7. General Order No. 372, Jun. 23, 1889, 181-48, Box 2, vol. for Oct. 15, 1883-Aug. 16, 1893, p. 136.

ADMINISTRATION TABLE NO. 1: BOSTON NAVY YARD, 1897



departments were small administrative and industrial fiefdoms, geographically occupying the same general site and frequently repairing the same ship, but each responsible to a different bureau in Washington. To be sure, Navy regulations provided for uniformity in numerous areas, especially respecting wages, length of work day, hiring and firing, and other matters involving civilian employees. But decentralization was the most striking administrative characteristic of navy yards at the end of the nineteenth century.

Before proceeding further with a description of the organization of the Boston Navy Yard, it should be mentioned that in the 1890s several different categories of commissioned naval personnel existed. Officers of the line held traditional navy rank. Line officers could command ships and men at sea. Other officers were members of specialized noncombatant "corps" or staffs, each officer having a staff rank as well as a "relative rank" in terms of the line. The Engineer Corps, specialists in steam propulsion, had staff ranks of chief engineer and assistant engineer. In March 1899, Congress abolished the Engineer Corps and integrated its former members into the line, with complex stipulations that certain officers, namely older men, would be restricted to shore duty or to engineering duty only. Naval constructors and assistant naval constructors made up the Construction Corps. Constructors, all of whom came under the Bureau of Construction and Repair, did not serve on board ship, since their duties centered on the design and building of vessels.

The Medical Corps included officers with the staff ranks of

medical director, medical inspector, and surgeon. Members of the Pay Corps served under the Bureau of Provisions and Clothing, which in 1892 became the Bureau of Supplies and Accounts. Their staff ranks were pay director, pay inspector, and paymaster. The remaining commissioned officers of the Navy included civil engineers, found in the Bureau and the Departments of Yards and Docks, and chaplains.[8]

In the 1890s, the personnel at the Boston Navy Yard consisted of commissioned officers, warrant officers, a few enlisted men, and civilian clerks, technicians, and manual workers. Administration of the yard and its various departments rested in the hands of the commissioned officers. All but two held positions in the yard's departments and thus were under the authority of one of the bureaus in Washington. The exceptions were the yard's two ranking line officers, the commandant and the captain of the yard. Navy regulations required these positions be assigned to officers of the line. The Equipment Officer and the Ordnance Officer, the heads of the Equipment and Ordnance Departments, as well as subordinate officers in their departments, were also members of the line. This meant that in the absence from the yard of both the commandant and the captain of the yard, either the Equipment Officer or the Ordnance

8. A listing of ranks is in Edward W. Callahan (ed.), List of Officers of the Navy of the United States... (New York: L. R. Hamersly & Co., 1901), pp. 12-13. A discussion of the staff officers appears in History of the Construction Corps of the United States Navy (Washington: Bureau of Construction and Repair, 1937), pp. 311-38.

Officer, whoever held the higher rank, would assume command. Generally, this turned out to be the Equipment Officer.

Line officers were regarded as competent to assume charge of other departments when temporary vacancies arose. Thus, on the absence from the yard of the Ordnance Officer, the Equipment Officer was carried as head of the Department of Ordnance. The reverse also happened. Since the yard never had a genuine Navigation Department, generally the Equipment Officer was listed as its head. When Naval Constructor Theodore Wilson died in June 1896, Cdr. Henry Lyon, Equipment Officer and formally head of the Navigation Department, also headed Construction and Repair.[9] Staff officers, however, never assumed command of any department but their own. At times, controversy developed in the Navy because of the division between staff and line officers.

Officers other than the commandant, captain of the yard, and those in the Departments of Equipment and Ordnance were members of one of the Navy's specialized staffs. Except for a brief period in 1891 and 1892 and again in 1895 and 1896, the yard had no naval constructor or even an assistant naval constructor. This suggests both a shortage of constructors in the Navy and the low priority given to the Boston yard's construction and repair function. Until 1897, usually a civilian general foreman administered the Department of Construction and Repair. Officers in the Department of Steam Engineering consisted of a chief engineer and an assistant engineer. Formally, the captain of the yard had administrative supervision of the Department of Yards

9. See Yard Log, Jun. 20, 1896, 181-58.

and Docks, but in practice the civil engineer ran the department. A pay director served as general storekeeper and also as head of the Department of Provisions and Clothing. A second pay director was the yard's paymaster. The yard's medical officer and head of the Department of Medicine was a naval surgeon.

For ten of the officers, the Boston Navy Yard was both place of work and home. The commandant resided in the large two-story house located in the northwest corner of the yard and designated Quarters "G." The yard paymaster, equipment officer, civil engineer, chief engineer, and general storekeeper each had one of the units in the "upper quarters," Quarters "B" through "F." The captain of the yard, ordnance officer, naval constructor, and medical officer lived in Quarters "L" through "O," the "lower quarters." All other officers had residences outside of the yard.

During the last decade of the nineteenth century, a yard chaplain was assigned to Boston for only brief periods. Chaplain Wesley O. Holloway served in 1891, and Chaplain David Tribou in 1897. The chapel was housed in a small brick building, No. 23, and the chaplain had an office in the Ordnance Building, No. 34.

The Boston facility was both an industrial center, that is a navy yard, and a military installation or naval station. Primarily as a naval station, the yard was connected with a number of other units, some in the yard and some elsewhere in the greater Boston area. Among these were the Marine Corps detachment, the navy prison, and the receiving ship, all located within the yard. Off-yard navy installations were the hospital

at Chelsea and the nitre depot at Malden. Officers of these units militarily came under the administration of the yard. A lieutenant colonel commanded the resident Marine Corps detachment, assisted by a staff of four subordinate officers. Attached to the yard were three medical officers on duty at the Chelsea Naval Hospital; a lieutenant commander and a gunner at the Malden depot; a pay inspector at the Navy Pay Office on Kelly Street; a lieutenant at the Boston Branch Hydrographic Office; and an assistant naval constructor, superintending the building of Gunboat No. 11 at the South Boston Iron Works. Commissioned officers and warrant officers were assigned to the receiving ship Wabash.

Each of the navy yards had a permanently moored receiving ship, generally a large sailing or otherwise obsolete vessel not needed for operational purposes. A receiving ship had no role in the industrial function of a navy yard, but came within the military oversight of the yard commandant.

The Navy originally established receiving ships as combined receiving, training, and distribution depots for enlisted men. These ships received new recruits and held them for distribution to seagoing vessels as vacancies occurred. In the days of sail, enlisted men had to be trained only as deck hands, and receiving ships provided the facilities for such training. At any given time, an estimated ten percent of the Navy's enlisted personnel were in transit from one vessel or shore establishment to another, and receiving ships provided the housing, messing, and administrative services required for such men. A receiving ship

had its own commander, officers, paymaster, and permanent crew.

With the advent of the new steel-hulled, steam-powered navy, receiving ships became anachronistic, especially as training centers, because of the greater diversity of skills and the more intensive instruction required. Specific training centers came into being. Under the weight of tradition, receiving ships persisted, although their functions of receiving and distributing enlisted personnel could more effectively be performed on shore.

The 300-foot-long Wabash, a frigate commissioned in 1836, served as the receiving ship of the Boston Navy Yard from 1876 to 1912, when she was struck from the Navy list. During the 1890s, she remained moored west of battery point. Listings of the yard's officers included those assigned to Wabash, and the yard's log contained entries covering the movements of "drafts" of men from the receiving ship. In 1897, the permanent complement of Wabash consisted of eleven officer and about sixty enlisted men. On board also were approximately one hundred recruits.[10]

The extension of the bureau system to navy yards in 1868 had the effect of decentralizing yard administration, enlarging the authority of the bureaus, and decreasing that of the yard commandant. Quoting a high ranking officer, one historian states that "the the bureau system `pulled out all of the teeth of the commandant´ and made him a sort of headpostmaster, whose duty was

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10. U.S. Naval History Division, Dictionary of American Fighting Ships (8 vols., Washington: Naval History Division, 1959-1981), vol. VIII, pp. 5-7 (Hereafter referred to as DANFS); Monthly Reports of Officers and Civilian Employees, 1884-1894, 181-63; Yard Log, Oct. 1, 1892, 181-58. For a discussion of the history and function of receiving ships, see "Receiving Ships," Dec. 12, 1919, 181-39, Box 665 (1920), 11.

to pass orders between the department at Washington and its representatives in the yard."[11] Indeed all correspondence, directives, and reports sent to and from a bureau and its department in the yard were addressed to the commandant. His office merely forwarded the documents to the concerned bureau chief or department head. Navy orders issued in 1889 defining the cognizance of the bureaus provided that "orders relating to matters connected" with each of the bureaus "shall be given by the Chief of Bureau to the commandants of the navy yards, who shall be held responsible for their execution."[12] Whatever his formal responsibility, a commandant played a passive, secondary role.

Basically, the bureaus received annual congressional appropriations for expenditures in navy yards for labor and material. The bureaus in various ways assigned portions of those funds to their departments in the yards. Congress also appropriated funds for specific uses in designated yards, again operating through the bureaus. A yard commandant had no funds under his control and thus lacked administrative leverage.

At least in the 1890s, the commandant of the Boston Navy Yard had little in the way of exclusive or final authority. He appointed officers to a variety of boards, such as the board on wages, but frequently the composition of the boards was dictated by Navy regulations. Moreover, as in the matter of proposed

11. Charles Oscar Paullin, Paullin's History of Naval Administration, 1775-1911 (Annapolis: U.S. Naval Institute, 1968), p. 352.

12. General Order No. 372, Jun. 25, 1889.

wages, the recommendations made by the boards required the approval of the commandant, but ultimate authority rested with the Secretary of the Navy. Some boards, such as departmental boards established to make surveys of work required on particular ships, functioned primarily on behalf of the respective bureaus in Washington, and the commandant simply sent on their findings, recommendations, and decisions.

The bureaus required periodic reports from their departments concerning diverse subjects, such as a monthly statement by the Department of Construction and Repair of the anticipated completion dates of repairs on ships in the yard. Since those reports went through his office, the commandant could keep informed of the progress of work.[13] On occasion, the commandant ordered more frequent reports prepared on ship work. The arrival in the yard in 1891 of Newark was such as instance. Commandant Thomas O. Selfridge, Jr., required daily reports in writing from his department heads of the progress on Newark.[14] Generally, commandants had responsibility for insuring that repairs on vessels of the fleet were performed in a timely fashion.

A commandant had authority to issue orders of a local nature, regulating matters peculiar to his yard, such as when the work day began and ended.[15] He also, consistent with orders of the Navy, proclaimed holidays. In other words, over his name the

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13. For example, see Naval Constructor to Commandant, Sep. 4, 1897, 181-17.

14. General Order No. 3, Nov. 3, 1891, 181-33, vol. 53, p. 49.

15. General Order, Feb. 23, 1898, 181-33, vol. for Nov. 12, 1891-Jul. 22, 1898, p. 529.

yard was informed of Navy orders and policies applicable to all departments and offices. He could and did act on his own authority respecting small matters, wherein one department interfered with the operations of another or which required coordination between two or more departments. In the Boston yard, departments jostled one another because they often shared shops and buildings or a department stored some of its articles in buildings assigned to another department. In 1891, when the Department of Construction and Repair was seeking to reactivate its boat shop, the commandant issued orders directing other departments to clear out material they had stored there. On another occasion, the commandant established territorial boundaries in the quadrangle of Building No. 42, the machine shop complex, by stipulating that the Equipment Department should have use of the western half and Steam Engineering the eastern.[16]

Should there be serious jurisdictional dispute between two departments as to cognizance, the matter would be resolved in Washington. Similarly, the commandant could not reassign or transfer an officer in one of the yard departments. Again, the bureaus had authority. So long as there existed a system of dividing the yard's work among a number of autonomous bureaus, the commandant exercised only limited power.

The commandant, a clerk, a mail messenger, and a regular yard messenger comprised the commandant's office. In the 1890s, at the top of each list of yard employees stood the position of "first clerk to the commandant," sometimes referred to by local

16. General Order, Apr. 16, 1891, 181-33, vol. 52, p. 228.

newspapers as the "commandant's secretary." John W. Hudson had been appointed first clerk on April 30, 1859, and served continuously from that time to the end of the century. Since all correspondence to and from the yard departments went through the commandant, his office required a communications center. Accordingly, that office included a mail messenger to handle items being sent or received through the postal system and a regular messenger to take care of distribution and collection in the yard. Until 1892, the commandant's office, as well as that of the captain of the yard, was in Building No. 29. Subsequently, it was relocated to No. 32.

The position of captain of the yard, second in command in navy yards, was always held by a line officer with the rank of captain. This officer had diverse functions. Formally the head of the Department of Yards and Docks, that officer's chores involved Yards and Docks personnel and equipment or other matters under the cognizance of that department. Watchmen, carried as Yards and Docks employees, came under the authority of the captain of the yard, he being responsible for security. He also had responsibility for the care and use of fire-fighting apparatus, which was in the possession of Yards and Docks, and had charge of fire fighting by military personnel and yard employees. Numerous physical facilities and appurtenances of navy yards brought the Department of Yards and Docks and the captain of the yard into close alliance. The captain had charge of "all landings, derricks, shears, cranes, sewers, dredges, railway tracks, cars, wheels, trucks, all vehicles for use of the yard, gradings, pavings, walks, shade trees, inclosure walls and other fences,

ditching, reserviors, cisterns, flags and awnings." He had authority over yard tugs and their crews, teamsters, stables, and all employees engaged in cleaning and clearing the yard.[17]

The captain of the yard maintained a "regular journal," or daily yard log, which recorded the reporting and departing of officers; arrival, departure, commissioning, decommissioning, and docking of vessels; daily meteorological observations; and other significant happenings in the yard. Besides making a record of the commissioning and decommissioning of vessels, the captain of the yard actually turned over a ship being commissioned to her commmanding officer and received a ship being taken out of commission. The captain of the yard had no clerical staff of his own, no manual workers, and no civilian or military assistants. As the occasion arose, he used workers of the Department of Yards and Docks as well as other personnel in the yard. For example, inmates of the navy prison in the yard cleared snow from walks and entrances in the winter under the scrutiny of their Marine Corps guards and the supervision of the captain of the yard.

There existed at the Boston Navy Yard in the 1890s an "Executive Department." This is not to be confused with the departments under the bureaus, but was a small two- or three-man unit, consisting of warrant officers. One was in charge of the yard scales and the others of the yard tugs. These men doubtless came under the control of the captain of the yard. All enlisted men detailed for duty at the yard were under his command.

In the Boston yard, the captain of the yard appears as an

17. Changes in Navy Regulations No. 6, Nov. 18, 1909, 181-39, Box 1.

important and busy officer. In addition to filling in as yard commander, when the commandant was away, he also sometimes headed the Ordnance Department during the frequent absences of its head. Finally, he served as senior officer of the Board of Labor Employment. The captain of the yard had an office in Building No. 29, until 1892, when he moved to quarters in the Muster House, Building No. 31.

The principal work of the Boston Navy Yard was in the hands of those departments dealing directly with the material condition of naval vessels, namely Construction and Repair, Steam Engineering, Ordnance, and Equipment. For analytical purposes, a fully functioning navy yard department can be viewed as consisting of various components: a naval officer, who served as its head; subordinate officers; a civilian chief clerk and other office personnel; and a body of mechanics and laborers, organized into shops and directed by foremen, master mechanics, quartermen, leadingmen, or laborers-in-charge. The material components of a department included office space, buildings or parts thereof, and facilities for the conduct of the department's work, equipped with the proper machine tools, implements, and supplies. Groups of mechanics and laborers specializing in certain industrial processes were known as "shops." The term "shop" also referred to a building or portion of a building in which the mechanics and laborers performed their tasks or which they used as an assembly point and tool storage area for work out-of-doors. Shops were always identified with a particular department.

In the 1890s, only the Equipment Department had all or most of the elements of a true department. Generally missing key

components were the Departments of Yards and Docks, Construction and Repair, Steam Engineering, and Provisions and Clothing. The Ordnance Department had officers and a physical plant, but little else. Not involved in industrial work and therefore unlike the other four departments were the Departments of Medicine and Navigation. The last mentioned, barely visible in the Boston yard records, had only one civilian employee and no officers of its own. The yard log listed the head of the Navigation Department as either the Equipment or Ordnance Officer, but that listing was a formality. In April 1897, the one Navigation Department employee disappeared from the records and along with him the entire department.

An understanding of the functions of a navy yard department requires familiarity with the work under its jurisdiction. That was determined by the cognizance assigned by the Navy Department and by Congress to the parent bureaus in Washington. What follows is a discussion of the various departments in the Boston Navy Yard in the 1890s in terms of cognizance, officers, clerical and work forces, and shops.[18]

The cognizance of the Bureau of Equipment in the last decade of the nineteenth century covered the purchase of raw materials for and the manufacture of cordage, anchors, chains, galleys, and canvas goods. The bureau also purchased and repaired shipboard nautical and astronomical instruments; corrected, adjusted, and

18. A comprehensive regulation describing the cognizance of bureaus was issued in 1889 in General Order No. 372. Congressional appropriations bills also indicate cognizance. For example, see Chapter 640, Jun. 30, 1890, United States Statutes at Large (99 vols., Washington: GPO, 1874-1986), vol. XXVI, pp. 189-206. (Hereafter referred to as SAL.)

tested compasses; and provided compass fittings, such as binnacles, tripods, and other appendages. Signal and lighting items fell within the responsibilities of the Bureau of Equipment. These included signal lights, lanterns, rockets, running lights, flags, lighting oil, and candles. Moreover, Congress made the bureau responsible for installing and maintaining electric lights on board ships. "Equipment" extended to shipboard communications, such as steering signals and gongs.

In addition to the items mentioned above, the bureau's mandate included ship's libraries, professional books and papers, drawings and engravings for signal books, photographic instruments and materials, stationery for ship commanders and navigators and for court martial proceedings, and music and musical instruments on board ship. By act of Congress, the Bureau of Equipment purchased, transported, and handled coal for use on ships, and purchased water for steam launches. Finally, legislation assigned to the bureau the "purchase of all other articles of equipment."

For many years, the Equipment Department of the Boston Navy Yard had eminence because of its ropewalk, the Navy's only facility for the manufacture of cordage. Legislation in 1882 and subsequent orders of the Secretary of the Navy made the department the most important unit in the yard. In 1886, the Navy practically closed all departments of the yard with the exception of Equipment. A few years later, the Navy restricted the Washington Navy Yard to the manufacture of ordnance. Previously that yard had been Boston's chief rival in the production of equipment articles. In the late 1880s, forge,

blacksmith, and chain making machinery was transferred from the Washington yard to the Boston yard, giving the latter a monopoly on manufacture of anchors, chain, and galleys, as well as cordage.

In the years 1890 to 1897, four officers, all of the rank of commander, successively served as Equipment Officer in the Boston Navy Yard and usually were the third ranking officer in the yard. Cdr. Benjamin F. Day, for example, frequently became yard commander during the absence of both the commandant and the captain of the yard. In addition to the status of its head, the department was also conspicuous because of the rank and number of its other officers. In June 1891, Commander Day's assistants included a lieutenant commander, two lieutenants, a boatswain, and a mate, and in October 1894, one of his successors, Cdr. James H. Sands, had two lieutenant commanders among his subordinates.

Building No. 40 housed the offices of the Equipment Officer, his assistants, and the department's clerical force. In 1890, that force consisted of two clerks, a writer, a draftsman, and a special laborer who performed "messenger's work in the office." In addition to the office staff, the department employed eleven men in capacities other than mechanics or laborers. Among them was Moses Webber, superintendent of the ropewalk and, with an annual salary of $1875, the highest paid civilian in the yard. Six master mechanics, quartermen, and leadingmen supervised the work of the department's shops.

Of the various departments of the Boston Navy Yard in the last decade of the nineteenth century, only Equipment

consistently had true "shops," in the sense of permanent organizations of mechanics and laborers engaged in specialized work. No payroll or other listing has been discovered providing a breakdown of Equipment workers or their work by shop, but six fairly distinct units can be recognized, at least in terms of articles manufactured: (1) ropewalk and wire rope mill; (2) machine, galley, and foundry shop; (3) forge, anchor, and chain shop; (4) rolling mill; (5) sail loft; and (6) rigging loft.

The ropewalk and its wire rope annex employed sixty-four men, namely Superintendent Webber, a quarterman ropemaker, twenty-nine ropemakers, twenty-three laborers, four special laborers, and six boys. Besides the ropewalk building, No. 58, and the wire rope mill, No. 79, the facilities of this shop included the tar pit storage shed (No. 59), tarring house (No. 60), hemp storage house (No. 62), and a coal shed (No. 78). Approximately forty-two men worked in the machine, galley, and Foundry shop, located in the western half of Building No. 42. A master machinist and leadingman machinist directed the activities of that shop. The anchor and chain forge had roughly twenty-six workers, supervised by a master blacksmith, a quarterman blacksmith, and a leadingman blacksmith. Chain was produced in Building No. 42, and anchors in No. 40, which also housed the rolling mill. At least five men worked in the mill. The sail loft, producing a wide variety of canvas goods, consisted of a master, a quarterman, and twenty-three sailmakers. Building No. 33 housed the sail loft. The rigging loft had a shop force of twelve, including a leadingman rigger.

The total of 184 workers employed by the Department of

Equipment in September 1890 was greater than the average daily work force for the years 1890 to 1897 and was probably a high for the early part of the decade. In the first half of 1893, roughly 120 men reported for work each day at Equipment shops. Midway through 1893, the figure began to rise, and in 1897 frequently, more than 200 workers were employed. Despite these seeming fluctuations, employment levels in the Equipment Department appear rather uniform when compared to the rapid changes in Construction and Repair. The Department of Equipment responded to the general needs of the Navy, which in peacetime did not change suddenly. Equipment was not dependent, as was Construction and Repair, on the arrival of ships in the yard. During 1894, 1895, and 1896, Equipment employees outnumbered all of the other departments combined, and throughout the period 1890 to 1897, Equipment was the largest single employer in the yard.

The Bureau of Construction and Repair had responsibility, according to appropriations bills, for:

> preservation and completion of ships on the stocks and in ordinary; purchase of materials and stores of all kinds; steam steerers, pneumatic steerers; steam capstans, steam windlasses, and other steam auxiliaries;...wear, tear, and repair of vessels afloat, general care, increase, and protection of the Navy in the line of construction and repair....

The order of 1889 contains a more detailed statement and gave the bureau authority over designing, building, fitting, and repairing the hulls of vessels, spars, boats, capstans, windlasses, steering gear, ventilating apparatus, tanks, ballasts, casks, blocks, furniture for ships' use, turrets, and armor plating. The order also recognized the bureau's exclusive

control of dry docks and slips.

During the years 1890 to 1897, the Boston Navy Yard constructed no ships and few if any boats, nor did it have any vessels on the stocks. The Department of Construction and Repair did repair a small number of vessels and outfitted at least one. Generally, the department divided its attention between repairing vessels in the yard and maintaining or improving its plant

Until the summer of 1897, the department did not have an officer, in this instance a naval constructor, as its head, except for relatively short periods. William Mintoyne headed the department briefly in 1891 and 1892, and Theodore Wilson served in the same capacity from July 1895 to June 1896. Wilson came to Boston after retiring as Chief of the Bureau of Construction and Repair in Washington. Naval Constructor Joseph Feaster reported for duty as head of the Boston department in June 1897 and remained until 1900. During much of the 1890s, a civilian, William G. Hichborn, managed the department in his capacity of "general foreman in charge." Hichborn started his career in the yard in June 1861 and thus had thirty years of experience. For his services as general foreman, he received a per diem wage of $5.50, a handsome rate in its day, but only slightly more than a master mechanic and somewhat less than the chief draftsman who served under him.[19]

Regardless of Hichborn's ability, that a civilian directed an important department constituted an administrative irregu-

19. Hichborn's wages and date of initial appointment are given in Report of Officers and Civilian Employees, 1895, 181-63. When he became general foreman is unknown, but he held that position in 1885. See List of Employees, Jul. 1, 1885, 181-63.

larity that the twentieth-century Navy would not tolerate. A Navy Department order of July 1891, which introduced competitive examinations for certain civilian supervisory positions in the Boston yard, stipulated that "the temporary position of General Foreman, Construction Department, will be discontinued as soon as the organization of the yard is completed." However, the position remained, and Hichborn occupied it until the end of the decade.[20]

Except for those periods when Constructors Mintoyne, Wilson, and Feaster served as its head, the Department of Construction and Repair was in the hands of civilians. That is to say, there were no assistant constructors or warrant or petty officers assigned to the department.

During the 1890s, the clerical staff of the department, housed in Building No. 24, steadily increased in number, while the force of mechanics, laborers, and their supervisors waxed and waned in size, depending on the extent of work required on ships in the yard. In September 1890, a clerk and a special laborer constituted the department's office force. By January 1895, a messenger, another special laborer, and a draftsman had been added. During the next three years, the number of employees doubled, and in December 1897, the office of Construction and Repair consisted of a clerk to the naval constructor, a stenographer-typist, three special laborers doing general office work, a messenger, a draftsman in charge, and two other

20. Special Order No. 7, Jul. 18, 1891, 181-47, vol. for Oct. 15, 1883-Aug. 16, 1893, p. 186.

draftsmen.

Between 1890 and 1897, the number of Construction and Repair mechanics and laborers varied greatly. During the first year and a half of the decade, generally less than thirty men worked in the department's shops. That force included an engineer and a fireman, both attendants at the dry dock pumping plant. The rest of the workers may have constituted two groups. One was led by a leadingman shipwright and consisted of four shipwrights, five joiners, a painter, and a toolkeeper. A leadingman laborer and twelve laborers made up the other group. Probably the two groups and the pump house workers made up a force used primarily in dry-docking vessels.[21]

In early 1892, the Construction and Repair manual labor force began to expand, and, during the next twelve months, numbered between 100 and 150 men. After March 1893, a contraction occurred, and from mid-1894 to mid-1897 it remained fairly stable at roughly thirty-five men. In the second half of 1897, a striking increase took place, at one time there being 272 men on the department's payroll. These gyrations meant that some shops were not permanent institutions, but disappeared as their workers were laid off and their supervisors reduced in rating. Such a situation occurred late in 1893. The bureau in Washington ordered the reduction in rating of four men. Master shipwright E. L. Hersey was reduced to shipwright first class; leadingman shipwight Albert S. Green to shipwright first class; leadingman joiner Horatio S. Seavey to joiner first class; and leadingman

21. General Foreman to Commandant, Sep. 8, 1890, and Aug. 20, 1890, both in 181-33, Box 52.

laborer John M. Tate to laborer first class.[22]

In December 1897, when the number of Construction and Repair workmen was approximately 170, there was a leadingman laborer and leadingmen and quartermen in the trades of shipwright, ship joiner, shipfitter, painter, and boatbuilder. Unlike the Equipment Department, Construction and Repair had a general foreman and no permanent master mechanics. When the volume of ship repair work increased, the department sometimes found itself unable to provide supervisory mechanics. For two weeks in the autumn of 1897, a master shipwright from Portsmouth Navy Yard directed the Boston shipwrights shop, and during the same season a Portsmouth quarterman plumber temporarily was assigned to Boston to assist in work on the gunboat Newport.[23]

Doubtless, the large group of men employed in 1892 and late in 1897 were organized into various shops, but the surviving documents do not specifically identify those units. The records do reveal many buildings assigned to Construction and Repair and which were designated as shops. They include the foundry (No.16), carpenter shop and laborers loft (No. 24), tinners and plumbers shop (No, 28), joiner and pattern shops (No. 36), smithery (No, 40), timber bending shop (No.66), mold loft and boat shop (No. 77), and mast house and spar shop (No. 85). Many of these buildings were not in use or were being prepared for use. Other structures in the yard were under the control of

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22. Bureau, Construction and Repair to Commandant, Dec. 11, 1893, 181-17, Box 18.

23. Commandant to Bureau, Construction and Repair, Sep. 21, 1897; Oct. 1, 1897; Oct 5, 1897, all in 181-16.

Construction and Repair, such as the dry dock engine house (No. 22), the dry dock itself, and four old shiphouses (Nos. 68, 71, 73, and 92).

Naval appropriations bills of the 1890s described the function of the Bureau of Steam Engineering only in general terms, namely repair and preservation of machinery and boilers of naval vessels, including new boilers; preservation of and small repairs to machinery and boilers of vessels in ordinary and receiving and training ships; and repairs and care of machinery in yard tugs and launches. Beginning in 1896, Congress included in the bureau's functions distilling, refrigerating, and auxiliary machinery. Navy Department orders of June 1889 described the cognizance of Steam Engineering as "all that relates to the designing, building, fitting out, and engineering of the steam machinery used for propulsion of naval vessels," including "steam pumps, steam heaters, and converters, and the steam machinery necessary for actuating the apparatus by which turrets are turned."

Uniformly throughout the period 1890 through 1897, the Steam Engineering Department of the Boston Navy Yard was headed by a chief engineer, who had the aid of an assistant engineer. No other Navy personnel, officers or enlisted men, were assigned to the department. Because of the small number of workmen employed by Steam Engineering, two officers could provide adequate administrative oversight. The department's clerical staff was minuscule, consisting of a special man or laborer, who performed general office work. Only in 1897 was a second special laborer,

a typist, added.

The Steam Engineering Department had a small force of laborers and mechanics. Except in 1892, it numbered between six and nineteen and generally was in the neighborhood of thirteen. Late in 1897, the department began to employ more men. Much of the department's work consisted of care and preservation of its considerable plant, most of Building No. 42 and a large assortment of machine tools. Given that function and the limited size of its work force, the department employed few mechanics with specialized skills. For example, Chief Engineer Alexander Henderson reported to the commandant in September 1890 that his department had nine workmen, including the special man engaged in clerical duties. Six had ratings of helper and two of general laborers. There were no machinists, boilermakers, patternmakers, flange turners, molders, or other ratings usually found in a machine shop.[24]

Who supervised Steam Engineering workers prior to February 1893 is unclear. Until that time, the department rolls carried the name of William H. Chapman, foreman. Chapman was originally appointed on May 7, 1889. Two weeks after his appointment, he received approval for a leave of absence. Apparently, he never returned to the yard, although he continued to be listed as an employee.[25] With the foreman on leave, perhaps the assistant engineer provided on-the-job supervision. In February 1893, J. D. Folsom became quarterman machinist, and from that time to the

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24. Chief Engineer to Commandant, Sep. 8, 1890, 181-33, Box 53.

25. Assistant Engineer to Commandant, List of Employees for June 1892, 181-112, vol. for Jul. 7, 1890-Jul. 20, 1893, p. 254.

Spanish-American War supervised the department's work force.

On one occasion in the mid-1890s, the chief engineer described the nature of his work force. That force was engaged in "making repairs in this & in some other Depts; preservation of machinery & tools, machinery on Passaic & keeping tugs in running order." The work performed by his employees did not "always correspond to their ratings, as the small allowance per month will not admit of having them of every trade required." The chief engineer mentioned his three mechanics, Folsom, the quarterman machinist and supervisor, and two others. "Riley is rated blacksmith & he is also a boilermaker & has been working at both trades when occasion required." "Eaton is rated pipefitter but can be employed advantageously at other work. These are the only mechanics...." As for the remainder of the force,

> the other men are rated as helpers, but their employment consists of whatever may be required as most necessary to be done. Men who can do work properly in more than one trade are certainly the most valuable in the Dept. on account of the variety of work.

In other words, the chief engineer acknowledged that his work force consisted largely of unskilled, jacks-of-all trades, and as such lacked the expertise needed for the repair of sophisticated marine machinery.[26]

It appears that the Department of Steam Engineering functioned throughout most of the 1890s without a shop or shops of specialized workers, beyond a single machinist, a blacksmith-boilermaker, and a versatile pipefitter. The office as well as

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26. This letter apparently is a draft and is unsigned and undated. Probably, it was written between January 1894 and the departure from the yard of Passaic in July 1896; 181-38, Box 1.

the machines and tools of the department were in the easterly half of Building No. 42, shared with the Department of Equipment. A vast structure, only parts of No. 42 were used by the two departments. Included in the machine shop complex were several other buildings, all under the control of Steam Engineering: a boiler house and coal shed (No, 43); copper shed (No. 44); engine repair shop (No. 45); and spare engine shop (No. 46).

Apparently earlier in the nineteenth century, the Ordnance Department had been a large and significant component of the Boston Navy Yard. In the 1890s, this was true no longer. The duties of the Bureau of Ordnance extended to "all that relates to the manufacture or purchase of offensive and defensive arms and apparatus,... war explosives, vessels for submarine torpedo service, magazines on shore, and all machinery, apparatus, equipment and things for use with the above." Also the bureau had the charge of "recommending the nature of armament to be carried by vessels, and...the material, kind, and qualities of ships´ armor and dimensions of gun turrets." The cognizance of Ordnance included fixing "the location and command of armament" and distributing "the thickness or armor," working within the carrying capacity of vessels as determined by the Bureau of Construction and Repair. Cooperation with the same bureau was required in the location of armories and ammunition rooms. Finally, the Bureau of Ordnance had the duty of "placing the armament on board vessels."

A single officer, either a captain or commander, administered the Ordnance Department of the Boston yard in the years 1890 to 1897. According to the yard log, the department

employed two to five civilians, the distribution between clerical staff and manual workers being unknown. None of the periodic lists of employees for the 1890s identify any person as Ordnance workers. This means that there were no clerks, writers, draftsmen, special laborers, master mechanics, foremen, quartermen, or leadingmen assigned to the department. Possibly the two to five men carried on the morning report worked at the nitre depot.

For an organization with a barely visible staff, the Ordnance Department had control of a large number of buildings. However, this may have been a legacy of greater activity in a previous era. The main Ordnance structure was Building No. 39. Other buildings identified with the Ordnance Department were two shell houses (Nos. 3 and 32), "old ordnance stores" (No. 34), heavy shell house (No. 47), and "shed for transporting wheels for guns" (No. 57).

At the Boston Navy Yard in the early 1890s, the Department of Provisions and Clothing did not engage in manufacturing, repairs, or any other industrial process. Its parent bureau in Washington had responsibility for "all that relates to supplying the Navy with provisions, clothing, small stores, fresh water, and contingent stores in the Paymaster's Department," including "the care and custody of all stores not exempt from the general storekeeper's system and keeping of a proper system of accounts regarding the same." At navy yards and other shore establishments within the United States, the bureau was "charged with the purchase of stores and supplies and their custody, transfer and issue," except certain exempted goods such as those

of the Bureau of Medicine and Surgery.[27]

The Bureau of Provisions and Clothing was central to one of the few reforms made in the bureau system during the 1880s and 1890s. Prior to 1886, each bureau procured its own stores and supplies, which resulted in navy yard departments accumulating stores far in excess of need. For example, in 1898, the Construction and Repair Department at Boston discovered in an old shiphouse 100,000 tree nails, which had deteriorated and were good only for firewood.[28] In addition to acquiring stores, each department maintained its own account of stored articles. Secretaries William C. Whitney and Benjamin F. Tracy achieved a significant reform by making the Bureau of Provisions and Clothing the chief purchasing agent for the Navy, and the general storekeeper in each yard had responsibility for the purchase and custody of all stores. Also Provisions and Clothing became the bookkeeper of the Navy, having sole responsibility for maintaining accounts of stocks and purchases. The new duties required a different title, and in 1892, Tracy ordered the designation "Bureau of Supplies and Accounts."[29] Both before and after the redesignation, the bureau was represented in navy yards by two units, independent of each other, the General Storekeeper's Department and the office of paymaster of the yard. In January 1890, Pay Director Rufus Parks held the positions of

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27. General Order No. 372, Jun. 23, 1889.

28. Naval Constructor to Commandant, Apr. 1, 1898, 181-33, Box 49, vol. 60, p. 50.

29. General Order No. 396, Jul. 21, 1892, 181-47; Paullin, pp. 381-3.

General Storekeeper and head of the Department of Provisions and Clothing. He had the assistance of two warrant officers, an exceptional situation, since during most of the decade his several successors had only one assistant. The GSK clerical staff remained basically the same in size and composition, consisting of a clerk to the paymaster, receiving clerk, shipping clerk, and bookkeeper. The manual work of the General Storekeeper's Department mainly involved the handling of stores in storehouses and elsewhere in the yard. Thus the bulk of the department's workers held the rating of special man, special laborer, or laborer. There were a few mechanics. For example, the force in September 1890 consisted of six laborers, three special men, and a cooper. The storehouse crew grew slowly in size, being ten in 1890, fifteen in 1895, and twenty in late 1897.[30]

Many buildings in the yard served as storage facilities, but no single building stands out as a GSK structure. Part of Building No. 38, which also contained the navy prison, housed stores and the GSK office. Other storehouses were Buildings Nos. 3, 4, 34, and 37.

The yard paymaster's office during the 1890s was staffed by a paymaster, with the rank of pay director or pay inspector, and a clerical force of three. This office made the payments of wages and salaries to yard employees. On the one hand, this was a simple task in an era before payroll deductions for income tax, insurance, and retirement benefits. On the other hand, the

30. GSK to Commandant, Sep. 1890, 181-33, Box 52.

expansion and contraction of the labor force required constant change in payrolls. The yard paymaster's office was in Building No. 5.

Except for the almost nonexistent Department of Navigation, the smallest department in the Boston Navy Yard was Medicine and Surgery. The mandate of the parent bureau extended to "all that relates to laboratories, naval hospitals, and dispensaries." The Boston yard contained a dispensary in Building No. 5. In 1890, the medical officer and head of the Department of Medicine was Surgeon Joseph B. Parker. His staff consisted of an apothocary, who resided in the yard, initially in Building No. 4 and after 1896 in No. 5. Beginning in 1894, a scrubber was also employed in the dispensary. Surgeon Parker and his successors provided medical services to Navy personnel stationed at the yard, treated civilian employees in emergencies, examined certain categories of job applicants, and made reports and recommendations on the health and sanitary conditions of the yard at large and particularly the navy prison.[31]

The agency in charge of the physical "plant" of navy yards was the Bureau of Yards and Docks. Its cognizance generally extended to buildings and other structures, grounds, internal transportation, fire fighting, weight-moving mechanisms, and utilities. Navy orders of 1889 assigned to Yards and Docks the construction and maintenance of all docks, dry docks, slips, quay walls, and buildings within navy yards. The bureau prepared plans and made cost estimates for the construction of such

31. Surgeon to Commandant, Sep. 8, 1890, 181-33, Box 52.

structures, consulting with the chief of the bureau for whose use they were designed as to their interior arrangements and their location in a yard. Yards and Docks also had responsibility for repair and furnishing of all navy yard buildings, storehouses, offices, and residences; for purchasing, selling, and transferring all land and buildings connected with the yards; for providing light, water, and sewers for buildings and the yards generally; and for supplying yards with fuel, except where furnished by other bureaus. The Bureau of Yards and Docks had sole control of all landings, derricks, shears, and cranes; all railway tracks, locomotives, and cars; all horses, oxen, wagons, carts, and teamsters. Clearing and cleaning the yards; constructing and maintaining roadways, walks, pavings, and fences; the maintenance and operation of fire engines and other fire-fighting apparatus; supplying furniture, stationery, clerks, messengers, and laborers for the offices of commandants, captains of the yard, and civil engineers -- all fell to the Bureau of Yards and Docks and its departments.

At the Boston Navy Yard and at other yards, the captain of the yard was the formal head of the Department of Yards and Docks. In actuality, an officer with the navy rank of civil engineer directed most of the activities of the department. Occasionally the civil engineer was carried on the morning report as the department head. Usually in the 1890s, he was the only officer on full-time assignment to the Department of Yards and Docks. During 1894, Lt. Cdr. J. V. Bleeker aided Civil Engineer F. C. Prindle and managed the department when Prindle was absent. For a time in 1891, a navy carpenter was also attached to the

department.

From 1890 to 1897, the office staff of the civil engineer consisted of a clerk, a writer, a draftsman, and a messenger. The broad responsibilities of Yards and Docks demanded a diverse force of skilled and unskilled workers. A Yards and Docks listing of its employees in September 1890 included one each of the following categories: watchman, gardener, stableman, fireman, machinist, piper, blacksmith, and "skilled man"; and two or more house joiners, teamsters, tinners, slaters, painters, and laborers. At that time, department employees probably totalled fifty or sixty.[32] The civil engineer himself, a foreman of laborers, and a leadingman painter provided on-the-job supervision. In August 1891, Prindle regarded his force as too diverse and varied for the department's supervisory personnel, especially since office work consumed much of his own time and since he frequently was on temporary duty at Portsmouth. Accordingly, he requested, unsuccessfully, the appointment of a "competent foreman of mechanics."[33]

The mechanics and laborers of the Yards and Docks Department in the 1890s do not appear to have been organized into several shops. Nor were particular buildings designated as the shops of the department. Part of Building No. 36 was the quarters of "Yards and Docks workers" until 1891, when they moved to Building

32. In its statement to the commandant, Yards and Docks listed only the ratings found among its employees and did not indicate the number in each, beyond using the single and plural; Captain of the Yard to Commandant, Sep. 3, 1890, 181-33, Box 52.

33. Civil Engineer to Commandant, Aug. 20, 1891, 181-33, Box 52.

No. 39. To the department were assigned a number of buildings around the yard, such as a shed for the storage of masonry material (No. 1), fire-fighting apparatus building (No. 6), cart shed (No. 25), and a barn (No. 56). Unlike the Department of Construction and Repair, the size of the Yards and Docks labor force did not fluctuate with the ships in the yard for repair. Rather, the number of workers depended on the size of building repair and plant improvement projects at hand. For example, in the summer of 1891, Civil Engineer Prindle requested authority to increase his force by twenty mechanics and laborers because of several current jobs, "the foundation for new steel shears, lowering bending mill #66, rearrangement of building #32, and other special objects."[34]

All construction of new buildings and facilities and all major repairs and renovations were done under contract with private firms. This meant that the Yards and Docks workers undertook only routine repairs and limited projects, still an enormous challenge in view of the number and age of the structures in the yard.

Throughout that portion of the Boston Navy Yard's history covered by this study, the basic organizational structure of the Boston Navy Yard remained that of commandant and a number of departments. Within that structure, changes were made in the twentieth century to achieve greater coordination and less duplication, especially among those departments involved in work on ships. However, the revitalization of the yard, which began in

34. Civil Engineer to Commandant, Jul. 31, 1891, 181-93, Box 52.

the 1890s, was carried out with an administrative structure originating before the Civil War.

THE YARD'S PHYSICAL PLANT

Gilded age partisan politics required that when the presidency passed from one party to another, the new administration in Washington take note of the errors of its predecessor. Benjamin T. Tracy, President Benjamin Harrison's appointee as Secretary of the Navy, observed this tradition in his first annual report, submitted in 1889. Directing attention to the Democrats' reduction of expenditures for navy yard maintenance, he stated: "The result is that the present administration of the Department finds itself handicapped by the tumble-down condition of navy-yard property."[35] Even allowing for a political bias, the Secretary's phrase "tumble-down" did not exaggerate the state of the navy yard at Boston.

Indeed, a half dozen buildings at the yard were in or near a state of collapse, and most of the rest needed urgent repairs. The dry dock featured crumbled masonry and barely working pumping plant, caisson, and swinging gate. Most of the piers could not be used for servicing ships of war, and the yard lacked any mechanism for moving heavy loads on or off vessels. Only parts of the yard thoroughfares were paved, the remaining roadways being frozen, muddy, or dusty, depending on season and weather. Boilers condemned years before remained in place, and makeshift,

35. Annual Reports of the Navy Department for...1889, Executive Documents, House of Representatives, 51st Congress, 1889, Document 1, Part 3, vol. I (Washington: Government Printing Office, 1890). Federal Serial Set No. 2721, pp. 28-9. (Hereafter referred to as ARND (FSS #)).

temporary arrangements for power and heat became permanent. In 1890, with a few exceptions, the yard's plant can generally be described as inefficient, unsafe, unhealthy, and unattractive.

In the last decade of the nineteenth century, the Boston yard included approximately eighty-eight buildings, fifty-three made of stone or brick and thirty-five of wood. Many of the wooden structures had been erected as temporary facilities during the Civil War, and twenty-five years after Appomattox found them in a sad state. Four wooden shiphouses survived, despite the advent of modern vessels. When a gale blew out the end of Shiphouse No. 73 in early 1898, a board of survey reported the condition of the building. In addition to the latest damage, the report catalogued the deterioration accumulated over the decades of neglect: the other end almost ready to fall down; foundation sills "all rotten"; large portions of the lower floor "fallen in"; shingles on the side of the building "partly fallen off"; almost all the windows "broken and a large portion fallen down"; slate roof considerably damaged; and "dry rot suspected in the framing."[36]

Of course, all was not dry rot and tumble-down in the Boston Navy Yard, and the large stone buildings provided the physical core for the revitalization of the yard. Most of the structures in which the Department of Equipment carried on its manufacturing were serviceable. Although some of the larger brick and granite buildings and the dry dock suffered from age and neglect, they

36. Chief, Bureau of Yards and Docks to Commandant, Feb. 19, 1898; Naval Constructor to Commandant, Mar. 14, 1898, both in 181-16, Box 9, vol. for Aug. 7, 1896-Apr. 4, 1898, pp. 645-8.

were reparable.

The point remains, nonetheless, that the plant of the Boston Navy Yard in the late nineteenth century was far from satisfactory. Even the commandant faced disagreeable working conditions, and the building containing his office (No. 29) was characterized as "at best unsightly and unhealthy," with no room for the proper storage of records, "now scattered about in unsuitable places and in danger of destruction."[37]

Complaints about defects in buildings were common. For example, during the last three months of 1892, two department heads informed the commandant of the want of repairs. A heavy rain in the morning of October 5 led to the cessation of work in the forge and anchor shop (No. 40), since the roof leaked so badly as to afford no protection to workmen or to work, and the floor was flooded. When reporting this situation, the Equipment Officer also noted that the roof over his office in Building No. 39 did not keep out the rain. The same storm brought forth the complaint from the chief engineer that the "roof over these offices [Building No. 42]...leaks very badly, and the plaster is so cracked and water soaked as to be in danger of falling." A rainy day in the following month closed the rolling mill. The Equipment Officer informed the commandant that the "mill workers are unable to work this morning on account of the rain and the condition of the roof. Six men were sent out; the others employed at other work." In late December of the same year, the

37. Civil Engineer, Annual Report of Expenditures and Operations for...1890, 181-154. (Hereafter referred to as AREO.)

chief engineer renewed his complaints about his office. The cold weather had caused the bursting of a water pipe, and the drain from the water closet had become stopped from freezing or some other cause.[38]

Had the Department of the Navy ordered a modern ship of war to the Boston Navy Yard in 1890, it is unlikely that the yard could have provided major repairs in an efficient and timely fashion. A sufficient number of mechanics and workmen could have been acquired. The real problem lay in the condition of ship repair facilities. Most of the machine tools of the Steam Engineering and the Construction and Repair Departments had been mothballed, and some were obsolete. Even more basic was the condition of the yard's dry dock and wharves.

The dry dock, a stone graving dock originally constructed in the 1830s, faced no immediate calamity and was being used in the 1890s for the repair of small private vessels by the Atlantic Works, a commercial ship repair firm, and for yard tugs and naval gunboats and auxiliaries. But the dock's masonry required attention. In addition to the dock itself, the facility included a caisson, a swinging gate, and the pumping plant located in Building No. 22. The battery of boilers for the pumps had been condemned in 1882 and 1883, and two portable boilers provided steam in 1890. The pumps themselves demanded frequent repairs and were considered unreliable. The caisson did not function efficiently, and the wooden gate needed to be replaced. The

38. Equipment Officer to Commandant, Oct. 5, 1892; Chief Engineer to Commandant, Oct. 5, 1892; Equipment Officer to Commandant, Nov. 10, 1892; Chief Engineer to Commandant, Dec. 2, 1892, all in 181-151.

defects in the dry dock and its appurtenances could be remedied, given adequate funds, and indeed, once started, repairs progressed rapidly. However, in the meantime, the condition of the dock constituted a major weakness in the Boston Navy Yard's capacity to serve the modern navy.

The same also held true for the yard's wharf facilities. In 1890, only one of the six wharves was in good repair, and only Nos. 2 and 3 could be used for ships of war. No. 1, the westernmost pier, saw service solely for the landing of coal. No teams or heavy weights were allowed on No. 5, which was described as "decayed and unsafe" and almost completely out of service. Several of the wharves had been condemned years before, but no funds had been made available for repairs. None of the wharves had a crane or shears capable of loading or unloading heavy weights.[39] This meant there could be no removal for repair or replacement of ship boilers, engines, heavy ordnance, turrets, or other items of great weight.

The physical condition of the yard in 1890 matched its function as a partially closed facility. Navy policy in the 1880s seems to have been to retain the yard in the possession of the government; use it for equipment manufacturing; perform minimal maintenance and repairs on its structures; and wait until the emergence of the new navy created pressures on Congress to reopen it. In piecemeal fashion, Congress responded in the 1890s, appropriating funds to improve the yard. The Navy authorized the acquisition and installation of new machinery in shops

39. AREO, 1890.

of the Departments of Construction and Repair and Steam Engineering to enable the yard to repair modern warships. During the decade, the yard's plant did not alter greatly. No new major buildings or facilities appeared, beyond the erection of a pair of steel shears, never placed into operation. But lesser changes began to occur, and the "new yard" was coming into view.

Because of the operation of the bureau system, no master plan existed for improvements in the yard as a whole. In its annual report to the Secretary of the Navy, each bureau made recommendations respecting its own buildings and facilities in the yard. The officer with the broadest view of the physical needs of the yard was the civil engineer of the Department of Yards and Docks. However, the system gave no greater influence to the recommendations of his bureau than it did to those of other bureaus. Moreover, projects the civil engineer supported sometimes conflicted with those of the heads of other departments. For many years, the civil engineer championed the development of a wet basin east of the dry dock. After becoming the yard's naval constructor in 1895, Theodore Wilson resisted that idea in favor of a second dry dock, a project that was ultimately adopted.[40]

Central to the success of a navy yard as a repair facility was a commodious graving dock in working order. Without a dock, there existed no possibility for the yard to perform work on the external parts of a ship below the water line, namely hull, sea

40. The annual reports of expenditures and operations prepared by the civil engineer constitute the best series for tracking the actual and proposed changes in the yard's plant.

valves, propeller, propeller shafts, and rudder. Repairs in dry docks extended from routine cleaning and painting to removal and replacing damaged plates. Relatively small craft could be serviced without a dry dock by means of marine railways, which hauled vessels out of the water. In 1890, the Boston Navy Yard had such a railway, although it was out of repair. The yard did have in service what several of its officers referred to as a "fine dry dock."[41]

The dry dock of the Boston Navy Yard was one of the two oldest in the Navy, having been constructed in the years 1827-1833, during which time was also built a dock at the yard at Norfolk. Both docks owed their operational longevity in large part to granite construction. In 1856-1857, the Boston dock was extended sixty-five feet, giving it a floor length of 368 feet and an overall length of 393 feet. In terms of World War I naval design, this allowed the docking of vessels 358 feet long. The sides of the dock were built in step fashion, the width of the dock on the floor being thirty feet and at the top of the dock or at the coping, eighty-six feet. Respecting depth and width, the dimensions of the entrance, or at or over the sill, were the governing factors, since the dock itself was wider and deeper than its entry. The width of the Boston dock's entrance was sixty-one feet at the coping, and the depth over the sill at mean high water, almost twenty-six feet. The tide in Boston harbor rose and fell by a little less than ten feet.[42] Built in

41. ARND, 1890, p. 57; ARND, 1895 (FSS # 3379), p. 408.

42. Public Works of the Navy (Washington: GPO, 1917), pp. 56-7. A copy of this report is in 181-39, Box 405, 6.

the masonry of the facility was a system of valves and filling and discharging culverts for flooding and emptying the dock. The dock also included capstans and windlasses with foundations in the masonry to assist moving the caisson and vessels and to operate the swinging gate. Chains running through pipes in the dock connected the capstans and the swinging gate.

Functionally associated with the dry dock was the dry dock engine and pumps, located in Building No. 22; the caisson; swinging gate; and the entrance slip. Either the caisson or the swinging gate could be used to seal off the entrance of the dock to allow removal of the water inside. The caisson was a hollow, ship-like mechanism with its own pumps, pump engine, and boiler. When filled with water, the caisson sank to fit tightly into the entrance to the dock. In the undocking of a ship, the dock was flooded through its own culverts and those in the caisson, and the water in the caisson pumped out, giving it buoyancy so it could be floated away from the entrance. The swinging gate operated as a watertight door. Having both a caisson and a swinging gate permitted the docking of the caisson, which like any vessel needed periodic repairs. Around the turn of the century, the caisson of the Portsmouth yard had to be towed to Boston for servicing, Portsmouth not having a swinging gate. Without its caisson, the Portsmouth dock was rendered temporarily unserviceable. For any dock to continue in operation, the slip to its entrance needed to be kept dredged to a point below the sill of the entrance.

Except during the servicing of its caisson or repairs to its other appurtenances, the dock at Boston was available for

CHART NO. 1: PLAN OF U.S. NAVY YARD, BOSTON, MASS, SHOWING LOCATIONS OF THE IMPROVEMENTS RECOMMENDED IN THE ANNUAL REPORT TO THE BUREAU OF YARDS AND DOCKS, AUGUST 1890.

LIST OF BUILDINGS

Qtrs. A, Porter's House
Qtrs. B, (Paymaster)
Qrts. C, (Equipment Officer)
Qrts. D, (Civil Engineer)
Qtrs E, (Chief Engineer)
Qtrs F, (Pay Director)
Qrts G, Commandant
Qrts I, Marine Barracks
Qtrs L, (Captain of Yard)
Qtrs M, (Ordnance Officer)
Qtrs N, (Naval Constructor
Qtrs O, (Surgeon)

No. 1, (Mason's Shed)
No. 3, Store House
No. 4, Store House
No. 5, Old Navy Stores
No. 6, Fire Apparatus
No. 9, (Furnace)
No. 10, Pitch House
No. 12, Pitch Boiling House
No. 16, Shed
No. 19, Scales
No. 20, Barn
No. 21, (Watch House)
No. 22, Engine House, Boiler House
No. 23, Chapel
No. 24, Carpenter Shop
No. 25, (Cart Shed)
No. 28, Tinners & Plumbers Shop
No. 29, Commandant's Office
No. 30, (Officer of the Day)
No. 31, Muster House
No. 32. Shell House
No. 33, Sail Loft
No. 34, Store House
No. 36, Joiner Shop, Boiler House
No. 38, Store House, Prison
No. 39, Ordnance Stores
No. 40, Heavy Hammer House
No. 41, Store Shed
No. 42, Machine Shop, Foundry, Smithery
No. 43, Boiler House, Coal Shed
No. 44, Shed
No. 45, Shed
No. 46, Shed
No. 47, Heavy Shell House
No. 48, Magazine
No. 49, Shed for Battery Guns
No. 52, Boiler House
No. 56, Barn
No. 58, Ropewalk
No. 60, Tarring House
No. 62, Hemp House
No. 63, Timber Shed
No. 64, Timber Shed
No. 65, Shed
No. 66, Timber Bending Shop
No. 67, Sawmill
No. 68, Ship House
No. 71, Ship House
No. 73, Ship House
No. 75, Timber Shed
No. 76, Timber Shed
No. 77, Mold Loft
No. 78, Shed
No. 79, Wire Rope Mill
No. 80, (Hoop Furnace)
No. 82, (Shed)
No. 83. (Shed)
No. 84, (Guardhouse)
No. 85, Mast House, Spar Shop
No. 87, Timber Dock
No. 92, Ship House

NOTE: The improvements recommended in 1890 by the yard's civil engineer consisted of: remodeling Building No. 32 for offices of the commandant and the captain of the yard (at location A); repair of Wharf No. 1 (B); construction of steel shears (C); building an electric light plant (D); paving and grading (E); rebuilding Wharf No. 5 (F); repair of the dry dock (G); development of a wet basin (H); enlarging the wharfage by building a new quay wall (I); and installing new water pipes at various places in the yard.

The map for 1890 includes some structures for which a number or letter is given, but no name or indication of its use. In the above list, information from sources other than the map is placed in parentheses.

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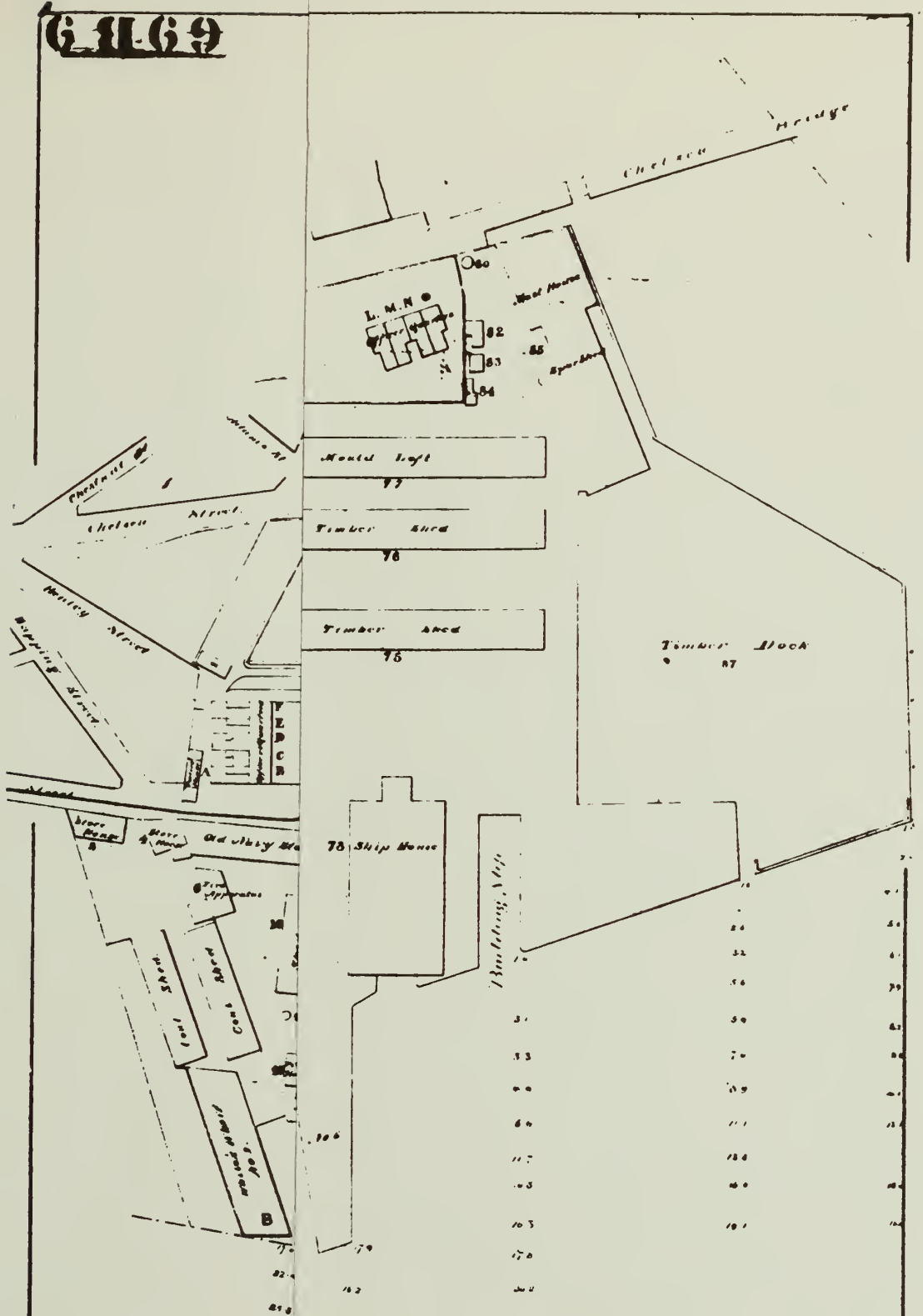

Plan of
U.S. NAVY YARD,
BOSTON, MASS.

Showing the locations of the
Improvements recommended in the
Annual Report to the
BUREAU OF YARDS AND DOCKS.

August 1880

Scale of Feet.

Figures indicate soundings in feet at mean low water from Plan of 1880

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Plan of U.S. NAVY YARD, BOSTON, MASS.

Showing the locations of the Improvements recommended in the Annual Report to the BUREAU OF YARDS AND DOCKS.

August 1880

Scale of Feet.

Figures indicate soundings in feet at mean low water from Plans of 1880.

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continuous use during the 1890s. That it was employed relatively infrequently by naval vessels during the years 1890 to 1896 resulted from other conditions in the yard and from Navy policy, not from basic deficiencies in the dock. On the other hand, maintaining the dry dock complex proved an enormous task for the Department of Yards and Docks.

The chief maintenance problem respecting the dry dock itself arose from the crumbling of the masonry binding together the granite stones. That crumbling allowed water to seep between the blocks. In the winter, the water in the joints froze and expanded, so as to tilt the stones or otherwise force them out of line. As the civil engineer reported in 1891:

> once the bond was broken, water could not be excluded from the joints and the effect of freezing was soon apparent. In some cases, the altar stones had been pitched backwards one-third of an inch per foot.

The engineer did not anticipate an early failure of the dock, but contended that "the action of the elements and forces of nature are gradually yet surely reducing it to substantially a mass of loose stone, and particularly the entrance works."[43]

The elements also damaged other parts of the dock's masonry, including the culverts, windlass pits, and chain pipes. Debris accumulated at the culvert gates, obstructing the movement of water into and out of the dock.

Maintaining the dock in working order required much labor, some heavy equipment, and large sums of money. In 1890, Congress authorized the expenditure for the dry dock plant at Boston of

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43. AREO, 1891.

$50,000, part of which was for "taking down and resetting the end" and "putting in the necessary backing and drainage."[44] Work on the dock in the 1890s included resetting altar courses, pointing masonry at the entrance, and repairing and overhauling culverts and culvert gates. Repair of the culverts and entrance work required construction in 1891 of a cofferdam around the seaward side of the entrance and the removal of the water to expose the parts needing attention. In the winter of 1895-1896, some damaged stones under the keel blocks were replaced with new material, cut from stones available in the yard.[45] Lesser repairs were also made during the decade. That work included resetting parts of the coping; repairs to flood gates; and overhauling valves and capstans. Nothing was done to improve the flooding capacity of the dock, except extracting an appropriation from Congress in 1897.

Repairs on the dry dock caisson were frequent, in part because they were needed and in part because of pressure to provide work for Construction and Repair employees. During the period 1890-1897, the caisson entered the dock three times, for a total of twenty days. Apparently, the caisson had been poorly refitted in the late 1880s, which left it with some mechanical and structural defects. On board the caisson was a Westinghouse engine and a centrifugal pump, but no boiler. As a result, it had to be emptied by manually operated pumps. This proved so slow as to make it impossible to remove the caisson on a falling

44. Chap. 640, Jun. 30, 1890, SAL, vol. XXVI, p. 193.

45. Naval Constructor to Commandant, Nov. 20, 1895, 181-74, Box 9.

tide, since the water level in the dock and to seaward fell more rapidly than in the caisson. Buoyancy could not be achieved until the tide rose again. Naval Constructor Mintoyne had doubts about a plan to connect the caisson pump by means of a pipe to the dry dock boiler 300 feet away, since it would not provide sufficient steam pressure to operate the caisson pump. He suggested installing on the caisson a small tubular boiler, then located in the Steam Engineering machine shop and unassigned.[46]

Problems with the caisson's pumping system persisted. In November 1897, Naval Constructor Feaster complained about the same condition as Mintoyne, the slow removal of the water ballast. Feaster noted the practice had developed during undocking to allow some of the water to drain out of the caisson before flooding the dock. This was dangerous, particularly when the vessel was of heavy draft and required a rapid undocking before the high tide turned.[47]

Feaster also pointed out that the culverts of the dock and the caisson lacked sufficient capacity to flood the dock on a rising tide. "In other words, the tide rises faster than the opening will allow the water to rise in the dock." As a result, "it takes two tides to remove the caisson for docking a vessel and the same for undocking."[48] Repair of the caisson in 1892, 1893, 1894, and 1895 included replacing gaskets, refitting

46. Naval Constructor to Commandant, Oct. 31, 1891, 181-33, Box 43, vol. 53, p. 18.

47. Naval Constructor to Commandant, Nov. 29, 1897, 181-16, Box 9, vol. for Aug. 17, 1896-Apr. 4, 1898, p. 18.

48. Naval Constructor to Commandant, Nov. 29, 1897.

valves, and work on the hull. In 1897, the Westinghouse engine was removed and overhauled.

In docking vessels, the caisson was always used, and the swinging gate saw service only in docking the caisson itself. Water in the windlass pits and chain pipes froze in the winter, causing the masonry to break up and rendering inoperative the system for closing the gate by windlass and chain. This created no serious situation, and block and tackle were used in the few occasions when the gate was employed. In 1895, as a preliminary to the docking of the caisson, the gate underwent repairs. Two years later, Congress provided $10,000 to replace the old wooden gate with a new one made of iron.

In 1895, the slip approaching the dry dock was dredged, since an accumulation of mud and silt interfered with the operation of the caisson. A private dredging firm removed 600 cubic yards of material, increasing the water depth of the slip by three and a half feet.

An important improvement in the dry dock facility in the early 1890s consisted of replacing the pumping plant in Building No. 22. The old system barely functioned. Both boilers had been condemned in 1882-1883, reliance being placed since that time on two "temporary boilers." The civil engineer in August 1889 claimed that "the pumping machinery is liable to give out at any moment." A small crisis arose in mid-summer 1890, when the yard docked three of the four Navy vessels to enter the dock that calendar year. Petrel left the dock on August 21, but on the following day, the Construction and Repair general foreman informed the commandant that immediate repairs were required on

both pumps, since patches affixed previously leaked and one valve was cracked. In such condition, neither pump drafted properly. Cushing, the Navy's first torpedo boat, and Rocket, the yard tug, were scheduled for docking the next day. Apparently, more temporary repairs were made, and Cushing and Rocket entered the dry dock as planned. However, the entire pumping plant needed to be replaced.[49] In June 1890, Congress funded that project.

In 1890, a contract was made with the Southwark Foundry and Machine Company of Philadelphia for a new pumping plant. Work at the yard began in January 1891 and was practically completed by the summer of the same year. The new plant consisted of a battery of four tubular boilers and two sets of centrifugal pumps. The contract also called for an additional discharge culvert made of cast iron. During the first six months of the year, the work did not interfere with the functioning of the dock, and four private vessels were docked and undocked. In October 1891, the boilers and pumps were formally tested and accepted by the Navy. Four boilers had been installed with the idea of having three in use and one in reserve.

The new plant functioned properly during the remainder of the decade, although some repairs and improvements were made. In 1893, to insure a supply of fresh water in the event of a stoppage in the municipal water service, a pipe was connected between the boilers and a reservoir at the head of the dock. In that year also, new castings were fabricated by the Southwark firm to replace broken parts of one of the pumps. Two years

49. General Foreman to Commandant, Aug. 22, 1890, 181-33, Box 9, vol. 52, p. 6.

later repairs were made on a device which indicated to the pump operator the height of the water in the dry dock. In 1895 and 1897, repairs included replacing pipes, overhauling furnaces, replacing some of the firebrick lining, and installing new plates on furnace doors. Temporarily, the battery of four boilers did double duty, producing steam for the dry dock and also for the dynamos of the electric light plant installed in 1895.

For the "new yard" to appear, parts of the old had to give way, and during the 1890s, thirteen wooden buildings were destroyed, including three of the four remaining shiphouses (Nos. 71, 73, and 92.) In 1891, the civil engineer argued against the demolition of the shiphouses, contending they were still valuable. That view demonstrates the lingering at the yard of a mentality more at home in the age of sail.[50] By 1900, however, Building No. 68 stood as the only surviving shiphouse. Other buildings removed in the 1890s included a storage shed (No. 37), a shed for gun wheels (No. 57), the angle bending shop (No. 61), a tool shed (No. 65), firewood shed (No. 81), an "old shed" (No. 83), the offices of the commandant and the captain of the yard (No. 29), cart shed (No. 25), and steam chest (No. 86). High winds blew down the last mentioned structure.

During the period 1890-1897, Yards and Docks employees worked on, if only slightly, every building in the yard, except those to be razed and small, unused or little used sheds, of which there were at least a half dozen. Some buildings, such as the dry dock engine house (No. 22) and muster building (No. 31)

50. AREO, 1891, 181-154.

received routine repairs, including painting and repair of doors, windows, roof gutters, downspouts, plumbing, and heating apparatus. Others, because of their age or condition or because of their being converted to different uses, received more extensive attention. Among the nonindustrial structures substantially reconstructed, modified or enlarged were the lower quarters, rebuilt under contract in 1889-1890; the navy prison (No. 38), which was extended; and the livestock barn (No. 56), the eastern half of which was converted, funded by a $4500 congressional appropriation, into a cart shed. In 1892, the commandant's office moved from No. 29 to freshly prepared rooms in No. 32. All during the 1890s, Building No. 5, erected in 1813 and one the oldest structures in the yard, underwent frequent repairs and occasional modifications. A multi-usage structure, No. 5 contained the paymaster's office, labor board office, dispensary, museum, surgeon's private office, guard room, and sailors' room. In 1896, a small room in the attic was outfitted as an apothecary. No. 5's boilers, none too reliable, provided heat for the building and for the upper quarters and the commandant's residence.

In the 1890s, the waterfront of the Boston Navy Yard included six wharves, Nos. 1, 2, and 3, located west of the battery, and Nos. 4, 5, and 6, east thereof. Ships of war could be accomodated only at two piers; No. 2, repaired in 1889, and No. 3, in need of repair, but still usable. The three wharves at the lower end of the yard had been surveyed many years earlier, but funds had not been provided to repair them. No teams or

heavy weights were allowed on No. 5, it being so decayed as to be unsafe. Wharf No. 1, also known as White's Wharf, was in use, but only to load coal.[51]

One yard officer, the civil engineer, supported an alternative to repairing or rebuilding the wharves. He favored the development of a wet basin in the area between the dry dock and Building No. 42. That area had certain natural features required for such a basin. When completed, the basin would have about 1900 feet of wharfage along its perimeter, double that of the existing waterfront. The proposed wet basin disappeared from consideration after 1892, except for some Yards and Docks maps. Its demise as an idea in part resulted from the emergence of prospects for a second dry dock, which, if built, would occupy part of the site of the proposed wet basin.[52] Moreover, talk of a new dock increased the necessity of providing the yard with adequate wharf facilities. Even without a second dock, the want of usable wharves constituted a major deficiency.

In 1893, Congress provided $20,000 for repair of wharves at the Boston Navy Yard. By 1895, all wharves except No. 4 had been rendered serviceable, the work performed by contractors and yard labor. No. 4 required complete reconstruction, since its floor boards had broken through in several large sections, and its facing timbers and fender piles were thoroughly decayed or worn out. Even without No. 4, the wharf facilities had significantly improved, and the yard was better equipped to handle the larger

51. ARND, 1889 (FSS #2721), p. 260; AREO, 1890; AREO, 1891.

52. AREO, 1890; AREO, 1891.

number of ships arriving in the Spanish-American War.[53]

Throughout the period 1890-1897, the waterfront of the Boston Navy Yard lacked the capacity to load and unload heavy weights onto and from ships. Wooden hoisting shears previously located on Wharves No. 2 and 4 had been condemned and removed. During the 1890s, funds were obtained and work begun on a pair of steel shear legs with a working capacity of 100 tons. The work progressed in stages, but never was fully completed. A New Hampshire firm, S. C. Forsaith Machine Company, manufactured the legs and delivered them in October 1892. Each of the more than 100-foot-long legs was constructed in the form of a square latticed post, which tapered at the ends to twelve by twelve inches from a width in the center of thirty-six by thirty-six, "thus combining great strength and stiffness with simplicity of construction."[54]

Forsaith Machine Company erected the legs on Wharf No. 2, and the Navy accepted the shears in February 1895. Later in the same year, Yards and Docks painted the mechanism, but it was never put into use. The civil engineer described the legs as "the practical beginning of a more mature and modern machine." For the shears to become operational required a third or back leg and an engine to move the back leg as well as to operate the hoist. In 1895, the shear legs received another coat of paint. The Bureau of Yards and Docks ordered additional parts, but the

53. Chap. 212, Mar. 3, 1893, SAL, vol. XXVII, p. 721; AREO, 1892; AREO, 1894; AREO, 1895; AREO, 1896.

54. Forsaith Machine Company to Commandant, Nov. 18, 1892, 181-151.

project faded, and the shear legs never served their original purpose of handling heavy weights. Adequate crane services appeared, as the Boston Navy Yard became more active.

Congress passed no legislation explicitly reopening the yard as a facility for the repair and construction of warships, but in June 1890 it did appropriate $152,000 for plant repairs and improvements. The language of the bill has importance. Fifty thousand dollars was provided each of the Construction and Repair Departments of the yards at Portsmouth, Boston, League Island, Brooklyn, Norfolk, and Mare Island "for additional tools...required to further improve the condition of the yard for repairing iron and steel ships." Also, the Steam Engineering Departments at Boston, Brooklyn, and Mare Island received $40,000, $75,000, and $50,000 respectively "for extra tools required to put the yard in condition for repairing modern marine machinery with economy and dispatch." The funds, in the cases of Boston and Mare Island, were to cover "improvements in boiler making plant, and improved machine tools."[55]

The appropriation and the phraseology accompanying it signaled the reactivation of the Departments of Construction and Repair and Steam Engineering at Boston, which had languished in the 1880s. Almost immediately, the two departments responded, and much of their energies in the 1890s were utilized in reopening and refitting their shops.

At the close of the Civil War, the Steam Engineering plant at Boston consisted of a number of large, modern machine tools,

55. Chap. 640, Jun 30, 1890, SAL, vol. XXVI, pp. 199-200.

collectively capable of constructing and repairing marine engines and boilers. The plant was housed in Building No. 42, generally known as the machine shop, the largest, tallest and most imposing structure in the yard. Built in 1857, it covered two and a half acres. Within its open court yard had been erected a boiler house and coal shed (No. 43), with a 240-foot chimney, famous as a local landmark. In 1890, the machine shop complex presented enormous challenges to the yard, especially to the Department of Yards and Docks, responsible for its repair, and to Steam Engineering, charged by Washington with making it workable.

The civil engineer's annual report of operations and expenditures in 1891 described the state of the machine shop. The most serious conditions included settling of the ground floor; the breaking away of the tops of the columns supporting the second floor, the columns being held upright by ropes; brickwork of the entire surface of external walls in need of repointing; cracks and bulges in the main walls of the foundry; cupola house damaged; and core ovens cracked. Worst of all was the state of a wooden roof erected between the machine shop and foundry wings, creating an effect known as the "Crystal Palace." The roof trusses had rotted away, and fifty-seven additional posts had been recently added to prevent the trusses from falling down. Of course, the roof leaked and the flooring under it suffered. Since shafting for powering machinery hung from the trusses, a serious situation existed.[56]

Not until 1898 did Congress provide moneys to erect an iron

56. AREO, 1891.

substitute for the crystal palace roofing of the machine shop complex. In the meantime, the Yards and Docks Department made other repairs, including a new tin roof for the cupola; resetting the support columns of the coal shed; repointing the exterior walls of Nos. 42 and 43; stopping leaks in the crystal palace; and repairing the roof over the chain, pattern, and boiler shops and the foundry. The Steam Engineering Department used its own funds and labor to relay the yellow pine and live oak flooring of the crystal palace and boiler shop wing.[57]

In addition to an ample structure in good repair, the machine shop required modern tools. The month following the $40,000 Congressional appropriation, the Bureau of Steam Engineering directed the yard department to prepare a list of the most necessary machines required. The yard's assistant engineer, C. W. Dyson, made such a list in August 1890, including costs of new machines and the expenses for setting and connecting them. In 1890, only one of the bank of eight boilers in the department's boiler house was safe to use, three of them having been condemned and four others being in bad condition. Accordingly, Dyson recommended six "cylindrical, horizontal, tubular steel boilers," each with a capacity to produce 135 horsepower. Having provided for steam power, Dyson then listed nine tools for the boiler shop: (1) boiler shell drilling machine; (2) hydraulic flanging machine; (3) accumulator and (4) hydraulic pressure pump; (5) vertical bending rolls for one-and one-half-inch steel; (6) hydraulic riveter for one-and-one-

57. AREO, 1892; AREO, 1895; AREO, 1896.

quarter-inch rivets; (7) a heavy chain hoist for the riveter; (8) heavy shears for one-and-one-half-inch steel; and (9) a ten-ton crane.[58]

With the exception of the ten-ton crane and with one modification, all of Dyson's recommendations received approval from the bureau, which made contracts with toolmakers in Ohio, Pennsylvania, Massachusetts, and New York for the construction of the machines. It appears to have taken a year to work up the contracts, advertise them, receive bids, and decide upon the contractors. The Navy inspected the machines while they were being built and also required contractors to provide blueprints of the floor and foundation spaces needed. When the department in Boston received these plans, it proceeded to prepare the foundations for the tools. This was no small task, considering the flooring of the machine shop. The vertical plate bending rolls required a substantial foundation of piles, concrete, and brick, the labor and materials totaling $3400. Navy engineers inspected the machines upon delivery and tested those that were installed. All of this took considerable time, and it was years before the boiler shop could begin operations.[59]

Some of the machines had yet to be installed by the turn of the century, a major hindrance being structural defects in Building No. 42. Those defects led to a long delay, for example,

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58. Bureau of Steam Engineering to Commandant, Jul. 10, 1890, 181-27, Box 5; Assistant Engineer to Commandant, Aug. 31, 1890, 181-33, Box 52.

59. Chief Engineer to Commandant, Sep. 28, 1891; Dec. 18, 1891; Mar. 21, 1892, all in 181-26, Box 3; Chief Engineer to Commandant, Sep. 14, 1892, 181-151, vol. for Aug. 1892-Apr. 1897, p. 8.

in the installation of an overhead traveling crane.

Besides obtaining and installing new machines, the Steam Engineering Department refurbished some of its existing plant and repossessed tools transferred in the 1880s to the Equipment Department. Apparently, early in 1890, Steam Engineering did not even have its own engine, which had been turned over to Equipment. The return of that engine was required to drive existing machines. Among other tools that had been assigned to Equipment were two planers, two engine screw lathes, a pair of shears, the entire cooper shop, and the smith shop.[60] During the 1890s, progress in improving the machine shop was irregular. The movement of machine tools was not always one way, and in 1894, the department received orders to send one brass turret lathe with all shafts, tools, and fittings to Norfolk for the temporary use of the Steam Engineering Department of that yard.[61]

During the 1890s, the Bureau of Construction and Repair in Washington and the department at the yard in Boston gave attention to outfitting or refitting shops needed to enable the yard to repair modern warships. Some of the correspondence between the bureau and department referred to the "steel shipbuilding plant at the Yard." To aid in designing and assembling that plant, Naval Constructor Wilson requested and received "trace plans showing the location and disposition of the steel shipbuilding plants at the Navy Yards, Mare Island,

60. Assistant Engineer to Commandant, Aug. 31, 1890, 181-33, Box 52.

61. Bureau of Steam Engineering to Commandant, 181-28, Box 5.

Norfolk, and New York."[62] The principal and on occasion, the only unit in the plant at Boston appears to have been a shipfitters shop. However, other shops received improvements as well.

Little appears to have been accomplished by Construction and Repair in the year following passage of the appropriation by Congress in June 1890. This may have resulted from the uncertainty of General Foreman William Hichborn of what should be done. In December 1890, he reported in highly general and somewhat inaccurate terms to the Bureau of Construction and Repair that machinery was in "good condition" in Building No. 22 (dock engine), No. 16 (foundry), No. 36 (joiner shop), No. 67 (sawmill), and No. 66 ("formerly used as timber bending mill"). Hichborn said nothing about other shops.[63] Perhaps, real progress had to await the arrival of a naval constructor. After William Mintoyne assumed direction of the Department of Construction and Repair in 1891, work on refitting shops began.

The bureau in Washington quickly approved recommendations made by a Board of Survey in June 1891, and, in the following December, Mintoyne submitted a summary of accomplishments. Construction and Repair workers converted Building No. 66 into an iron plate shop. The two-story structure previously had been a timber bending shop and had most recently served to store old machinery and material. After removing those items, workers

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62. Bureau of Construction and Repair to Commandant, Jun. 3, 1893, 181-17, Box 18; Bureau of Construction and Repair to Commandant, Mar. 31, 1896, 181-17, Box 20.

63. General Foreman to Commandant, Dec. 16, 1890, 181-33, Box 52.

raised the building, laid new foundations for the structure and machine tools, and then lowered the building. Extensive repairs were made to the engines and boilers, and a new iron chimney was erected. Two-thirds of the tools and most of the shafting and pulleys had been installed. Eighty percent of the nearly $17,000 expended on the plate shop went for labor.

Two thousand dollars, again mostly for labor, had been spent to erect two small sheds for plate bending. One building would contain a bending slab, not yet received from Norfolk, and the other a furnace. The bureau suspended work on this project in November 1891.

Other work reported by Mintoyne in December 1891 included repairing the engine and boilers in the joiner shop (No. 36), machinery General Foreman Hichborn had described in the previous December as in good condition. In fact, tools had not been connected to the engine because of a worn bearing in the main shaft. With its own engine out of service, the shop had used a "small engine left by the Department of Yards and Docks, being more economical for the little work wanted." In addition to renewing the shaft bearing and connecting the tools to the main engine, the shop required a band saw. The sawmill (No. 67) received repairs to its foundation. Old material stored there was removed, new tools were installed and connected, and the shop was reported to be " running and in good order."

With regard to a few Construction and Repair shops being improved in the second half of 1891, work consisted mainly of clearing, cleaning, and returning tools previously removed. This was the case with the boat shop (No. 36), smith shop (No.

40), plumbers shop (No. 28), and block shop. More extensive work was done on the shipfitters shop (No. 66), a two-story wooden structure, with the pattern shop on the second floor and the shipfitting tools on the first. Mintoyne advised the bureau that machinery, shafting, pulleys, and belting had all been put in place and repairs made to the engine. The shipfitters' machine shop, the iron plate shop, and the bending shed and furnace may collectively have constituted the steel shipbuilding plant.[64]

The shipfitters shop grew as machine tools acquired under contract arrived at the yard. Also, subsequent heads of the Department of Construction and Repair made changes in arrangement of tools. The bureau accepted Naval Constructor Wilson's recommendation in 1895 that the machines should be "swung around, that is their order be reversed."[65] That rearrangement took more than a year to accomplish. A makeshift quality appears evident in the development of the shipfitters shop. In 1899, the civil engineer wrote that the "present building, or rather series of buildings, has been erected without apparent sequence, as addition after addition has seemed to be necessary." He claimed "the bunch of buildings" formed "the greatest fire menace in the yard."[66]

Since its shops already enjoyed operational status, the Department of Equipment did not participate in plant improvement to the same degree as the Departments of Steam Engineering and

64. Naval Constructor to Commandant, Dec. 3, 1891, 181-33, Box 43, vol. 53, p. 84.

65. Naval Constructor to Commandant, Sep. 13, 1895, and Nov. 11, 1895, both in 181-16, Box 9.

66. AREO, 1899.

Construction and Repair. Significant additions to the Equipment plant had occurred in the late 1880s, with the transfer from the Washington Navy Yard of tools, hammers, and other implements for the manufacture of anchors, chain, and galleys. To accomodate the transferred and new equipment, the blacksmith shop at Boston had been enlarged.

In the last decade of the nineteenth century, Equipment Department buildings and machinery received normal repairs and maintenance from Yards and Docks and its boilers the services of Steam Engineering. In 1890, four twenty-year-old boilers in the ropewalk were retubed, and in 1899, they were replaced. As a consequence of a $12,000 appropriation by Congress in 1890, the chain forge was equipped with a new electric welding machine for making steel links for chain cables of sizes up to two and one-half inches. Another tool improvement in the chain forge was the installation of a new chain testing machine, the one transferred from Washington being a "relic of the past."

Progress in improving the plant of the Boston Navy Yard in the 1890s proved to be faltering, frequently incomplete, and sometimes temporary. For example, both the civil engineer and the naval constructor recognized the inadequacies of the shipfitters complex and recommended an entirely new building. The delay in strengthening the roof of Building No. 42 prevented installation of a much needed traveling crane in the machine shop of Steam Engineering. The iron plate shop (No. 66) survived only until 1903, when it was demolished. Nevertheless, the capacity of the yard to serve the modern navy expanded.

In the 1890s, the transportation system within the Boston

Navy Yard consisted of horses, oxen, wagon, carts, and railroad trucks and wheels. Most of the roadways in 1890 lacked paving and remained in that condition during the decade. "Main Avenue," running eastward from the Water Street gate, was partially paved. In 1891, Yards and Docks workers took up the paving between Building No. 5 and Building No. 22, including a section of cobblestone, and relaid the surface with square granite blocks. In 1893, the paving on Main Avenue was extended to Building No. 40. During the same year, the main entrance was repaved with asphalt block.[67]

The yard's railway track system consisted of rails of an old-fashioned flat variety that did not admit the entrance into the yard of locomotives and rolling stock in general use by commercial railroads. During the 1890s, the yard's track system was repaired and parts relaid, but it was neither expanded nor altered. Track reconstruction occurred in 1891 and 1893, first from the yard entrance to the head of the dry dock and later from the shear wharf, No. 2, to Building No. 67, the two sections being connected at the head of the dry dock. In May 1897, repairs were made to the track near the main gate.[68]

In the late 1880s and in the 1890s, significant improvements took place in the yard's water and sewage systems. Health considerations may have had a role in prompting both, since rumors and medical suspicions connected those systems with fifty-nine "acute but mild cases of diarrhea" in the Marine Corps

67. AREO, 1890; AREO, 1891; AREO, 1893.

68. AREO, 1891; AREO, 1892; AREO, 1893; AREO, 1897.

barracks. In addition to drinking purposes, fresh water was required for use in boilers, for certain industrial processes, and for machine tools, especially new hydraulic devices being acquired by the Steam Engineering machine shop. A number of small reservoirs existed in the yard, such as the one near the west end of Building No. 75. The yard's main source of water was the municipal system.

In 1889, the yard medical officer, Surgeon J. B. Parker, stated that the water pipes then in use had been laid a quarter of a century ago and were believed to be in a state of decay. Mystic Pond, five miles distant from the yard, provided water for the municipal system, with which the yard was connected. Surgeon Parker regarded that water as generally "wholesome." However, in water coming from that source through the yard pipes, "now and again a disagreeable quantity of vegetable matter, mud or rust -- exceptionally visible animal life -- has been observed." The surgeon expected the quality of the water to improve with the installation of new and larger mains in the yard.[69]

In August 1887, Congress provided $32,000 for the rehabilitation of the yard's water system. Work began in March 1889 and involved excavating and removing old mains and laying new ones. By the summer of 1890, essentially all major work had been completed, In subsequent years, additional lines were laid to serve buildings reassigned or receiving new equipment. For example, the main in the machine shop quadrangle was extended through Building No. 43 into the boiler shop to supply water for

69. J. B. Parker, "Sanitary Report, Navy Yard Boston," in ARND, 1889 (FSS #2721), pp. 797-801.

the hydraulic riveter and hydraulic flanging machine, then being installed by Steam Engineering. Also in 1892, a service pipe was laid from the new main to the sawmill (No. 67) and to the new offices of the commandant in Building No. 32. In the following year, Yards and Docks workmen cleaned out the reservoir near Building No. 75, temporarily connected it with the roof drainage from Shiphouse No. 73, and ran a 500-foot pipe from the reservoir to Building No. 60 to supply water for its boilers. Throughout the period, repairs were made to pipes, hydrants, and fixtures as required.[70]

Prior to the 1890s, all of the yard's sewage was deposited locally, that is through outlet pipes at the waterfront. In addition, the sewage systems of several adjacent communities terminated at or near the yard. This changed as the Metropolitan Intercepting Sewer system went into operation. In his 1889 report, Surgeon Parker stated he could not obtain definite knowledge about the location of the yard's sewers and drains. It seems clear that the existing system included old, sometimes wooden pipes; that it malfunctioned; that drainage backed up into buildings; and that numerous sites in the yard gave off disagreeable odors, such as traps to collect surface water and places where drains emptied into the harbor. Especially obnoxious was a large privy vault near the navy prison, used by prison guards and yard workers. This proved particularly offensive, since not far distant was a popular promenade. The main sewer of the community of Charlestown emptied its contents

70. AREO, 1889; AREO, 1890: AREO, 1892; AREO, 1895; AREO, 1897.

into the harbor at a point in the yard near the Chelsea Bridge. The town of Chelsea discharged sewage into Chelsea Creek, which carried it into the harbor. It then collected off the yard's waterfront.[71]

Until 1895, the old drainage and sewer system remained in operation, although improvements were attempted. A new water closet was erected in the corner of Building No. 33 for prison guards, and the nearby privy vault torn down. In 1890, portions of a drainage pipe were laid to connect the recently rebuilt lower quarters with the Charlestown system. Two years later the drain from Building No. 38 was changed to connect with a sewer main, and a five-inch stoneware drain laid from the east end of No. 28 to outfall in the wet basin.[72]

The dramatic change came in 1895, when the yard was connected to the Metropolitan Intercepting Sewer. That system originated with the city of Boston, which discharged its sewage into the harbor at Moon and Deer Islands. After passage of legislation by the state government, the system was extended to surrounding towns, including Charlestown and Chelsea. Connecting those communities with the new system meant that their sewage no longer ended up off the navy yard. Moreover, in 1895, a line from the Metropolitan system was laid through the yard, entering near the center of the ropewalk and exiting near the main gate. Yard drains previously discharging into the harbor were connected with the new system. Although problems remained, a modern sewage

71. Parker, "Sanitary Report," 1889.

72. ARND, 1890 (FSS #2838), p. 580; AREO, 1890; AREO, 1891; AREO, 1892; AREO, 1893; AREO, 1894.

system had come to the yard.

Another significant improvement in 1895 occurred when electric lights replaced gas illumination. That change was especially conspicuous because of the steady deterioration of the gas system. Various local corporations had provided gas to the yard, in the early 1890s the supplier being Charlestown Gas and Electric. In 1881, a navy commission had condemned the gas pipe service as "worthless." Subsequent observers characterized the system as "almost useless for years," having "manifest leaks and weaknesses...in major portions of pipe system," and "a constant source of expense." Essentially, the yard was without illumination in nighttime, making it difficult for arriving and departing workers during the short winter days and preventing an effective night patrol of the yard during the entire year.[73]

Annually beginning in 1889, if not before, requests were submitted for funds for an electric lighting system. After installation of the new dry dock pumping plant in 1891, the point was made that the yard had surplus boiler capacity to drive electric light dynamos or generators. Congress acted in July 1894 and provided $15,000 for an electric light plant at Boston. An additional $1500 was granted in March 1895. The Navy negotiated a contract with General Electric in September 1894. Preliminary work consisted of wiring the yard buildings. Also it was decided to install the plant in the northern half of the ground floor of Building No. 28, hitherto used by Construction

73. Charlestown Gas and Electric to Commandant, Jun. 14, 1893, 181-151, vol. for Aug. 1892-Apr. 1897; ARND, 1889, p. 269; AREO, 1891; AREO, 1891; ARND, 1891 (FSS #2931), p. 105; AREO, 1893.

and Repair as a plumbers shop.[74]

The two dynamos required a secure foundation. In an excavation nine feet deep, two courses of live oak were laid, with broken stone ballast between the logs and covering the first course. A pair of concrete pedestals came next. The exhaust system consisted of two cast iron pipes, running underground from the dynamo room to the edge of the wet basin. Bulkheads in the room provided for a small shop, a storage area, and an office. A steam supply pipe connected the dynamos with the dry dock boilers in Building No. 22. General Electric started the plant on March 23, 1895, and operated it for the next six days, whereupon the Navy immediately accepted the plant. The receiving ship Wabash was among the first facilities served by the new system.[75]

A flaw was discovered in the electric light system at the same time the dynamos were being accepted. Essentially, the lighting plant needed its own boilers. The dry dock pumps required three boilers, leaving one to drive the dynamo engines, which was sufficient for the short-night season. During the rest of the year, however, generating electricity demanded two boilers, which meant that the pumping plant and the electric light plant could not both run at the same time. Moreover, the dry dock boilers were constructed to blow off at eighty-five pounds of pressure, whereas efficient operation of the dynamos required steam at one hundred pounds. With a further

74. Chap. 165, Jul. 26, 1894, SAL, vol. XXVIII, p. 130; Chap. 186, Mar. 2, 1895, SAL, vol. XXVIII, p. 831.

75. AREO, 1895; ARND, 1895 (FSS #3379), p. 75; ARND, 1896 (FSS #3486), p. 171.

appropriation from Congress, Ames Iron Works of Boston manufactured two boilers and an iron smoke stack, In December 1896, this new equipment was installed in the southern half of the first story of Building No. 28, the northern part being the dynamo room. Cold weather prevented running water mains to the new boilers until April of the following year. The boilers were accepted and put into service on May 1, 1897.[76]

In the 1880s and early 1890s, an electric light plant had been recommended to replace the defective gas system for the purpose of providing illumination for the yard and its buildings. However, as early as 1891, thought had been given to the utilization of electricity for powering industrial machinery. In that year, Naval Constructor Mintoyne considered the installation in the shipfitters shop of a dynamo to drive existing machine tools, to run a new electric drilling mechanism, and ultimately to light shops and vessels under repair. Although the shop remained unelectrified, quite clearly the Boston Navy Yard was entering the new world of electricity.[77]

The introduction of telephones was another yard improvement in the 1890s. The Muster House (No. 31) contained the switchboard, and in 1899, forty-seven telephones were installed.[78]

In the eight years before the Spanish-American War, the basic appearance and essential plant of the Boston Navy Yard

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76. AREO, 1895; AREO, 1897; Chap. 399, Jun. 10, 1896, SAL, vol. XXIX, p. 367.

77. Naval Constructor to Commandant, Dec. 3, 1891, 181-33, Box 43.

78. AREO, 1897; AREO, 1899.

remained unaltered. No additional buildings, docks, piers, or other structures were added. However, significant improvements did occur, consisting of wharf repairs, a new dry dock pumping plant, installation of new machine tools, provision for a proper water system and efficient sewage removal, and the introduction of electricity and telephones.

CIVILIAN EMPLOYEES: POLICIES AND PROBLEMS

Commissioned officers administered the Boston Navy Yard, making the decisions required on the local level and implementing the decisions and policies adopted in Washington. Civilian employees performed the actual work carried on in navy yards. An interesting and somewhat unique circumstance resulted, with naval officers overseeing the endeavors of a large group of non-military personnel. Some of the officers, members of the line, had commanded naval ships and their crews. Administering an industrial establishment presented problems different from those encountered in an entirely military operation. Moreover, navy yard officers, especially members of the line, served tours of duty generally two years in length. To be sure, some officers had prior experience in other yards. But the relatively brief tours of officers contrasts with the long careers in the yard of some of the civilian employees. In 1890, chief clerk John Hudson, having held his post for more than thirty years and having seen a dozen commandants come and go, probably knew more about the yard and its functions than any officer. In short, the civilian personnel, especially those like Hudson with many years of service, provided an important element of continuity amidst

rapid turnover in officers. In addition, of course, the employees supplied the mechanical skills and the labor necessary to fulfill the mission of the yard.

In the years 1890 to 1897, introduction of civil-service type regulations was the most important development respecting civilian workers. Those regulations contributed to the waning of "the old yard." Other matters pertaining to civilian employees remained unaltered or changed very little. For example, nearly all employees, manual and clerical, received the same remuneration for their services at the end of the period as they had at the beginning.

Several developments explain the Navy´s initiation of civil service procedures. Civil service reform was one of the few causes receiving widespread support in the Gilded Age, and it had the rare distinction of being advocated by both major national parties, albeit for somewhat cynical reasons. Passage of the Pendleton Civil Service Act in 1883 offered a beginning, although only ten percent of government workers were covered by the original legislation. The measure provided for the use of competitive examinations to determine on a merit basis a person´s fitness for appointment to a government position. It also forbade the levying of political campaign assessments on federal employees.

The manipulation of personnel for partisan advantage had given navy yards a particularly unsavory reputation in a period noted for its corruption. The costs of running the yards increased because of the role of the patronage in their employee

practices. As Congress began to commit itself to the building of a new navy, it appeared that funds were inadequate to pay for both modern warships and inefficient, political-ridden yards. Moreover, the new vessels and their complex machinery required high levels of skill in their construction and repair. Those skills often seemed in short supply in yards where political criteria determined eligibility for employment. Finally, the appointment of several Secretaries of the Navy genuinely dedicated to improvements in the fleet and in shore establishments aided the cause of reform of policies respecting civilian employees.

A key ingredient in the political use of navy yards before the 1890s was the authority foremen and master mechanics had to hire and fire men employed under them. With supervisors possessing such power, the system only required a party-faithful as civilian head of the Navy, ready to comply with personnel recommendations made by congressmen and senators within whose districts navy yards were located. Themselves appointed by the Secretary because of their partisan loyalties, foremen and master workmen could be counted on to hire men of the same political persuasion and who at election time would vote for their political sponsor and his party.

An even more blatant practice was that of increasing the yard force immediately before an election to garner additional votes. An act of Congress in 1876 prohibited enlarging the number of employees within sixty days of a presidential or congressional election, except when the Secretary of the Navy

ruled the national interest required the hiring of additional workmen. Despite the obvious intent of the law, the practice persisted. During the months before the 1888 Harrison-Cleveland contest, the Brooklyn Navy Yard increased its work force by one thousand men, all of whom were discharged after the election.[79] Given the notoriety of navy yard politics, the necessity of having competent men to perform ship repairs, the general need to improve efficiency at the yards, and the commitment of Navy Secretaries Benjamin Tracy and Hiliary A. Herbert, the effort to reform employment is understandable.

During the Gilded Age, the Boston Navy Yard was probably neither worse nor better than other yards respecting the patronage. Quite clearly, forces outside the yard influenced or sought to influence decisions respecting the hiring and firing of employees. In 1875, a group of outraged Bostonians petitioned the Secretary of the Navy, protesting against one Joseph H. McDaniel for merely seeking employment in the yard, McDaniel "being a democrat and a man of infamous character." According to the recollections of an old yard employee written in 1917, one foreman of the 1870s or 1880s, known as Jerry, "the Rabbit," was:

> always ready to obey the wishes of the bosses, and it was no easy matter for a laborer to get work in that department unless he was of Jerry's political faith....Barbers were hired as painters, who were friends of Jerry's, because they were good with the "brush."

Certainly, Massachusetts politicians viewed the yard from a political perspective. A student of the origins of the modern

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79. Fourteenth Report of the United States Civil Service Commission, July 1, 1896 to June 30, 1897, FSS #3689, p. 181.

navy writes that Henry Cabot Lodge "considered the Boston facility as his own fiefdom." In 1890, a member of the Massachusetts state legislature, during a debate on a resolution to support reopening of the Boston Navy Yard, stated that the yard "was used as a political machine." He further contended that "the yard as a political machine had been more effective than its mechanical machinery."[80]

Whatever the Boston Navy Yard's political role, there was no temporary enlargement of its work force at the time of any of the presidential or congressional elections during the years 1888 to 1892. For the period beginning in 1890, Lodge appears only slightly more active than other Massachusetts congressmen and senators in interjecting himself into personnel decisions at the yard. For example, in the autumn of 1890, James Wall, a painter, was discharged because of a slump in activity at the yard. Early the following year, Lodge contacted the Navy Department on Wall's behalf, noting: "As work will doubtless soon begin I should like him taken on, if...it is for the good of the service."[81]

In the last decade of the nineteenth century, several different groups of civilian employees existed at the Boston Navy

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80. To George M. Robeson, Feb. 26, 1875, 181-38, Box 2; "Reminiscences of the Boston Navy Yard, By an Old Employee," in P. W. Handlin, History of the Boston Navy Yard (mimeographed typescript, 1937), pp. 8-9; Benjamin Franklin Cooling, Gray Steel and Blue Water Navy: The Formative Years of America's Military-Industrial Complex (Hamden, Conn.: Archon Books, 1979), p. 55; article in unknown newspaper, Jan. 24, 1890, 181-83.

81. Yard Log, 181-58; Lodge to Capt. Norman H. Farquhar, Mar. 14, 1891, BNHP, Record Group 1, Series 60, vol. I. For similar intervention by another congressman, see Ernest Roberts to Frank Maxon, Oct. 31, 1899, BNHP, Record Group I, Series 60, vol. II.

Yard. Distinctions can be made between manual workers, who put in an eight-hour day, and clerical employees, who worked seven hours; between the few receiving an annual wage and the many paid a per diem rate; and between unskilled laborers and skilled mechanics. Introduction of civil service regulations tended to clarify differences among employees. From the perspective of appointment procedures and the determination of pay, five principal categories can be found. Smallest in number were those whose positions were part of the "Civil Establishments" of the several bureaus. Until 1909, Congress included these positions in its annual appropriations bill, explicitly specifying them by job title and salary or wages. For example, the 1897 bill contained the provision:

> CIVIL ESTABLISHMENT, BUREAU OF SUPPLIES AND ACCOUNTS;...Navy Yard Boston, Massachusetts: In general storehouse: One bookkeeper, at one thousand and seventeen dollars and twenty-five cents; one shipping clerk, at one thousand dollars; one receiving clerk, at one thousand dollars. In yard pay-office: One writer, at one thousand and seventeen dollars and twenty-five cents; in all, four thousand and thirty-four dollars and fifty cents.

At the Boston yard, employees holding positions in the Civil Establishment were clerical and office workers, the superintendent of the ropewalk, and several Yards and Docks workers, namely a foreman laborer, two messengers, and a master of tugs. All employees in the yard receiving an annual salary were Civil Establishment personnel, although some others of those personnel were paid per diem wages.[82]

A second group of employees consisted of supervisory

82. Chap. 386, Mar. 3, 1897, SAL, vol. XXIX, p. 657.

workmen. General foremen directed departmental labor forces; master mechanics headed shops; and quartermen and leadingmen supervised crews of mechanics, laborers, and helpers. This group also included positions of quartermen- or leadingmen-in-charge. Supervisors received their appointment from the Secretary of the Navy, after 1891, on the basis of a competitive examination. The Secretary also set the per diem wage rates for foremen and master workmen. Some quartermen and leadingmen received the wages of first-class mechanics in the same trade, plus an additional fifty or twenty-five cents a day.

Mechanics or skilled workmen constituted a third group, and laborers and helpers a fourth. Prior to 1891, foremen did the hiring of all manual workers. Subsequently, those groups received appointment through the operations of a yard Board on Labor Employment. Another board recommended their wages. There remained a fifth category of assorted workers. Civil Service regulations classified some of them as "special employees." Others were draftsmen, shipkeepers, janitors, and watchmen. All in this fifth group were appointed by the Secretary and received per diem wages as fixed by him.

Beginning in 1891, navy yards came under Civil Service procedures, including appointment and promotion on the basis of merit, the use of impartial registers maintained by a board of yard officers, and the utilization of competitive examinations. Secretary of the Navy Tracy took the first step in April 1891, promulgating a comprehensive set of regulations for the appointment of foremen and superintending mechanics. In the following September, he extended the system to include the hiring

of workmen. Those original regulations underwent modest revision, and the system prevailing in July 1896 was adopted by the Civil Service Commission as its regulations for navy yards. President Cleveland, later in 1896, endorsed the arrangement and ordered that "no modification of the existing regulations shall be made without the approval of the Civil Service Commission."[83]

In the 1890s, Navy and Civil Service regulations recognized four classifications of yard workers: Schedule A, unskilled; Schedule B, skilled; Schedule C, foremen, quartermen, and others in charge; and Schedule D, special employments. Unskilled workers included common laborers, helpers in all trades, hod carriers, teamsters, and other occupations requiring no mechanical trade, experience, or education. Skilled workers were those having a mechanical competence in a particular recognized trade or craft, such as blacksmiths, chain makers, machinists, shipfitters, and toolmakers. "Forms of labor which can not be classified under any of the ordinary trades" fell under Schedule D, Special Employments. Two ratings, special mechanics and special laborers, comprised Schedule D. For all ratings under Schedules A, B, and D, four wage classes existed, first, second, third, and fourth, the highest and the best paid being first. All of these ratings and classes existed in navy yards before the Civil Service procedures were instituted.

The major reform accomplished by the new employment policies

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83. ARND, 1891, pp. 53-5. Information for this discussion about civil service regulations at navy yards is taken from Fourteenth Report of US Civil Service Commission, pp. 124, 166-83. For an abridgment of Tracy's 1891 regulations, see New York Times, Aug. 2, 1891, p. 2.

in the 1890s involved the hiring of workmen. No longer did foremen hire and fire employees in their departments. Now all applicants had to meet certain basic requirements, and the actual appointment of laborers and mechanics was through labor registration lists maintained by a board of yard officers. Applicants for positions as supervising mechanics and foremen took competitive examinations. As noted, the Secretary of the Navy made the appointments under Schedule D.

To be considered for navy yard positions, applicants had to submit to the Board on Labor Employment a number of forms and certificates. These included evidence that the applicant was a citizen of the United States or that he had served in the nation's armed services, from which he had been honorably discharged. Another form was a "character certificate, which must be signed by a respectable citizen of the applicant's locality, testifying to the latter's character and habits of industry and sobriety." The Board on Labor Employment, at its discretion, could refuse to register anyone convicted of "crime, misdemeanor, or vagrancy."

Applicants for positions as skilled mechanics needed to submit evidence of competence in the trade in which they applied for appointment. This was accomplished by a certificate

> signed by a firm or member thereof, superintendent, master workman, or other person under whom the applicant has worked at his trade...certifying his capacity in said trade and his character and habits of industry and sobriety.

Different certificates were used by applicants who had previously worked at a navy yard. One of these was a discharge card to be signed by the department head, who also entered a grading of the

applicant's performance.

Men seeking appointment under schedules A and B were required to present in person at the labor office an application form and the required certificates. The board's recorder wrote a brief physical description of the individual on the application. The board could make further inquiry into the applicant's character and capacity, if it appeared practical and expedient. Should the job seeker meet the basic requirements and his papers be in order, he would then be registered, that is his name would be placed on the registration list for the position sought.

The system required the creation in each navy yard of a Board of Labor Employment. That board consisted of three commissioned officers, namely the captain of the yard and the senior assistants of the two departments employing the greatest number of workers. If a department lacked an assistant, such as the Department of Construction and Repair at Boston, then the department head served. The commandant designated an officer to serve as recorder, whose office was staffed by a clerk. The Board on Labor Employment had responsibility for the proper, effective, and impartial enforcement of Navy and Civil Service regulations. The recorder's task consisted of insuring the correctness of the board's papers and records.

Names of registrants were listed according to the time and date of registration. A separate list was maintained for each trade. As openings occurred, the men at the top of the list were appointed. A system of preferences gave advantage to veterans and to former navy yard employees. The order of preference is as

follows:

1. Honorably discharged Civil War veterans.

2. Those who had served in the Navy or Marines since the Civil War for at least twelve years and who had been honorably discharged less than two years before registration.

3. Former navy yard workers with discharge ratings of "excellent" for workmanship and not less than "good" for conduct.

4. Those who had served in the Navy or Marines for six years in the same trade for which they were registered, who had received honorable discharges less than two years before registration, and whose average conduct was marked at "4" or better.

5. All others.

In filling a labor requisition for a particular trade or occupation, the labor board would use all of the names in the first list, then all in the second, and so forth.

After an applicant had been on the list for one year, his name was dropped unless he requested in writing to have his eligibility extended for another twelve months. This extension could be renewed in each successive year.

When a navy yard department required the services of laborers or mechanics, its head made out a requisition to the Board on Labor Employment, specifying the number in each occupation or trade required. That requisition was routed through the commandant for his approval. Upon receipt of the requisition at the board, the recorder sent to the department the number of names called for and notified by postcard the men so named, instructing them to report to the board on or before a specified date. When the registrant appeared, he was checked against the physical description contained in the file and was

sent to the department head. That officer tested the man's qualifications to ascertain his suitability for the work and to determine a provisional wage class. At the end of two weeks, the department head assigned a permanent class to the new worker.

Promotions and reductions from one class to another in the same trade could be made by the department head with the approval of the commandant, depending on the competence and conduct of the employee and the needs of the Navy. Heads of departmemts also played a role in discharging workers either because of poor performance or because of the necessity to decrease the labor force. Department heads and foremen were expected to be familiar with the performance of each of their workers. Leadingmen and quartermen, the on-the-job supervisors, were responsible for reporting in writing an employee whose workmanship or conduct appeared unacceptable. Upon receipt of such a report, a foreman made an investigation and forwarded the report with his recommendation to the department head. That officer could issue a warning to the employee or add his own recommendation and pass the matter on to the commandant. Commandants had the authority to "disrate," that is to lower workers in class, to suspend temporarily, or to discharge them.

In the 1890s, the Secretary of the Navy introduced competitive examinations to fill vacancies in supervisory positions of Schedule C. When informed by a navy yard commandant of an opening in such a position, the Navy Department prepared public notices and advertisements, describing the position and stating the time and date of the examination. The Department also convened a board of officers at the yard to conduct the

examination. All citizens who could give satisfactory evidence of experience in the work to be done were eligible to be examined. The board of officers constructed the examination, which was to be of a practical nature; ascertained each candidate's physical fitness; determined if each had sufficient education to make out reports and perform the necessary estimates and calculations; and investigated evidence as to character and habits. After the examination, the board reported to the Navy Department, stating the comparative worth of each candidate and indicating the name of the individual it regarded as most qualified. The Secretary of the Navy made the actual appointment.

The new regulations governing the hiring of navy yard employees were instituted in the summer of 1891, when the work force at the Boston yard was relatively small. This probably eased the transition. On the other hand, two years later began the worst depression yet suffered by America, and that doubtless increased workers' anxieties about reforms being made in personnel matters.

The first stage of the new system affected the Boston Navy Yard's supervisors. In orders issued in mid-July 1891, Secretary Tracy declared vacant, as of August 15, the positions of superintendent of the ropewalk, master blacksmith, master machinist, and master sailmaker, all in the Equipment Department, and foreman laborer in the Yards and Docks Department. He also proclaimed the discontinuation of the post of general foreman of Construction and Repair "as soon as the organization of the yard is complete." To fill the newly created vacancies and also to

select a master shipwright and a quarterman shipfitter for the Construction and Repair Department, Tracy announced competitive examinations, to be held on July 31 or as soon as practical. The Secretary's order included instructions regarding the qualifications of candidates, the board of examiners, and the nature of the examination.[84]

No new faces appeared in the yard as a result of the first competitive examinations. The vacancies created by the order of July 1891 were filled by men who already worked at the yard and who, at least in some instances, were the incumbents. The appointees included master sailmaker Benjamin D. Wiley, first employed in the yard in 1861; master blacksmith Samuel Dwight, in 1867; quarterman shipfitter John H. Roberts, in 1866; ropewalk superintendent Moses Webber, in 1871; and Yards and Docks foreman Josiah H. Eldridge, in 1877. In addition, the Construction and Repair general foreman, a position ordered discontinued, remained -- as did its occupant, William Hichborn.[85]

The reform of Navy civilian personnel procedures encountered difficulties in the Boston Navy Yard, because it created rigidities in assigning jobs to workers already employed. According to the new system, when work for a particular rating waned in a department, the now idle hands should be laid off or at least furloughed. And should there, at the same time, be increased work in other trades, the head of the department was required to requisition additional workers through the labor

84. Special Order No. 7, July 18, 1891, 181-47, Box 2.

85. See Report of Civilian Employees, Dec. 1897, 181-113.

board. However, this procedure was not followed by at least one department at Boston. Differences in interpretation of the regulations, if not outright irregularities, were occurring in several yards, and in 1895 the Secretary of the Navy appointed Lt. John J. Knapp to investigate. Knapp's report on the Brooklyn yard led to the detachment of two officers. From New York, the lieutenant proceeded to Boston to make an inquiry into improprieties in the Department of Equipment, the yard's largest employer.[86]

The irregularities had occurred under Capt. James H. Sands, transferred to the Portsmouth yard before Knapp's investigation. Essentially, Sands had reclassified mechanics when work slumped in the ropewalk, assigning them elsewhere in the Equipment Department until rope production picked up. That practice retained in the yard the expertise necessary for the operation of an important facility. However, Sands' actions violated Navy regulations. Since the officer had been reassigned and since his motives appeared benevolent, both respecting the Navy and the employees, no heads rolled as a consequence of Knapp's visit. After the turn of the century, workers themselves or their unions began to maintain surveillance of the boundaries between trades, and protests were made on behalf of workers in a particular trade when work in that trade was assigned to men who had not been specifically employed in that rating.

Regulations prevailing in the 1890s did permit one department to make temporary use of the skilled mechanics of

86. New York Times, Aug. 31, 1895, p. 12.

another.[87] This practice, nevertheless, produced one protest. On November 8, 1893, Robert Meekin, a Construction and Repair blacksmith, was discharged because of the lack of work. Meekin, who was a black American, reregistered with the labor office, but during the course of a year failed to obtain work elsewhere, probably owing to the general economic decline. Meekin solicited the aid of Senator Henry Cabot Lodge, alleging that he had suffered from racial discrimination, since blacksmithing work was required in the Department of Construction and Repair, but it was being done by blacksmiths from Equipment. In fact, according to Meekin, Equipment had recently hired another blacksmith.[88]

Lodge wrote to the Chief, Bureau of Construction and Repair, who referred the matter to the Boston yard. Commandant Joseph N. Miller had an inquiry conducted and reported to the bureau that no new blacksmiths had been taken on by any department and that the little blacksmithing required by Construction and Repair was being "done by requisition on Equipment." The commandant further stated that Meekin "is registered as a blacksmith and stands fifth under the rule for employment in that trade, but at the present time the limited amount of work will not warrant the employment of a single man." No evidence of discrimination against Meekin was found. "On the contrary, there seems to be a disposition on the part of everyone

87. Lt. Knapp collected information about this procedure during his visit; John Knapp to Commandant, Aug. 19, 1895, 181-151, vol. for Aug. 1892-Apr. 1897.

88. Lodge to Chief, Bureau of Construction and Repair, Dec. 1, 1894; Commandant's endorsement, Dec. 12, 1894, both in 181-16, Box 9.

to do all they can for him, on account of his good character and his previous service."

At least one other black worker was employed in the Boston Navy Yard in the 1890s. He too was laid off. However, so were scores of other manual employees. An incident in the early twentieth century suggests that racial prejudice was more likely to be found among white blue-collar workers than among naval officers or supervisors.[89] The Meekin affair is of further interest because it reveals the continuation of the involvement in yard personnel decisions by politicians, interceding on behalf of constituents.

In the 1890s, most per diem manual workers at the Boston Navy Yard and at all other shore establishments received wages determined according to a formula adopted three decades earlier. A provision in an act of Congress in July 1862 stipulated:

> That the hours of labor and the rate of wages of the employees in the navy yards shall conform, as nearly as is consistent with the public interest, with those of private establishments in the immediate vicinity of the respective navy yards, to be determined by the commandants of the navy yards, subject to the approval and revision of the Secretary of the Navy.

Prior to this enactment, yard commandants had authority to fix wages as they thought best.[90]

Although the basic 1862 formula remained, the method of its implementation altered over the years. A wage board system went

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89. See below, pp. 266-8.

90. Information and quotations in this discussion about navy yard wages are taken from Guy McPherson and Mary Watts, Fixing Wages and Salaries of Navy Civilian Workers in Shore Establishments, 1862-1945, Administrative Reference Service Report Number 9, NAVEXOS P-289.

into effect in 1864, when the Secretary of the Navy ordered navy yard commandants to appoint "a Board to be composed of one line officer, one head of Division, and one master workman" to make inquiries at private companies in the area to determine hours and the "wages paid to each class of workmen." On the basis of its findings, the board prepared a general schedule of wages which it submitted to the commandant. The proposed schedule was posted in the yard to enable workmen to study it and give their views on its content to the commandant.

From the commandant, the proposed schedule was forwarded to Washington. If the Secretary of the Navy gave his approval, the schedule went into effect without change for two months. Prior to the end of that period, the wage board would prepare a new proposed schedule. In 1869, the bureau system asserted itself, and henceforth a separate schedule was prepared for each department in a navy yard, to be sent to its parent bureau and then to the Secretary. By 1890, other modifications had appeared. Schedules were prepared quarterly, not every two months, and the composition of the Board on Wages increased from three to five men.

Wage schedules set forth the pay of employees in terms of per diem rates. Complications arose in 1868, when Congress enacted the eight-hour day for all government laborers, workmen, and mechanics. The President proclaimed there should be no reduction in wages paid "by the day" on account of the implementation of the eight-hour reform. Confusion resulted since the Navy sought to have its yards function ten hours a day, at least in the summer months. A circular letter from the

Secretary of the Navy in 1878 stated "the Department will contract for the labor of all mechanics, foremen, leading-men, and laborers on the basis of eight hours a day" and "all workmen electing to labor ten hours a day will receive a proportionate increase in wages."

By 1890, the Boston Navy Yard was following an eight-hour schedule for all seasons for its manual laborers. Office employees worked only seven hours. The Board on Wages was directed to fix per diem wages in multiples of eight, nearest in amount to wages paid by neighboring private establishments. However, the rate fixed was not to be lower than the rate paid by such establishments.[91]

Until 1896, the Board on Wages at the Boston Yard may have functioned as an assembly of delegates of the several departments. Its composition consisted of the Chief Engineer of the Steam Engineering Department, who acted as its senior member; the Ordnance Officer; the Equipment Officer, or one of his subordinate officers; the General Storekeeper; and the general foreman of Construction and Repair. After receipt of a directive to prepare a wage schedule, the senior officer advised the other members of the board to prepare schedules for their departments. At some point, differences among schedules had to be reconciled. However, since the tendency in the 1890s was to make no changes in existing wage rates, little difficulty seems to have been encountered. The Board then prepared a common schedule in

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91. Acting Secretary of the Navy to Commandant, Apr. 24, 1889, 181-11, p. 117.

triplicate, and all schedules were routed to the commandant.

At least one commandant did not routinely forward proposed schedules to the Department in Washington. In December 1894, Commandant Miller returned the general schedule to the board, pointing out several errors. In 1896, he raised criticisms about the procedures of the board, stating that "in the past the Board has not always met as a Board," nor did it adhere to Navy regulations. He further charged that "much of the Board's work had been done informally." The board's task became somewhat easier in 1896, when the Secretary of the Navy ordered schedules for each department were no longer required and that a general schedule was to be prepared semi-annually, not quarterly.[92]

Wages and salaries paid civilian employees at the Boston Navy Yard in the 1890s remained constant. Comparison of the wage schedule for the quarter July 1 to September 30, 1889, with that for the first half of 1898 indicates that approximately fifty ratings stayed the same. Wages changed in only eleven instances, five increases and six decreases. All increases were in the amounts of twenty-four or thirty-two cents a day. For example, wages for first-class boatbuilders went up from $2.80 to $3.04, second-class from $2.56 to $2.80, third-class from $2.32 to $2.56, and fourth-class from $2.00 to $2.32. Some of the decreases in the six ratings experiencing reduced wages were in larger amounts. The pay for first- and second-class pile drivers

92. Commandant Miller, 1st Endorsement, Dec. 27, 1894; Commandant, Memorandum for Senior Member, Board on Wages, Apr. 29, 1896, both in 181-3, Box 3, vol. for Nov. 12, 1891-Jul. 22, 1898; General Order No. 9, Mar. 3, 1896, 181-47, Box 49, vol. 60.

went down by seventy-two cents. However, the chief point is that for every one instance of a change in wage rates, there were five instances in which no change occurred.[93]

Salaries and wages assigned by Congress in 1890 to Boston yard employees in the Civil Establishment were identical to those in 1897. The Civil Engineer recommended that the Navy Department and Congress recognize and rectify an inequity in the salary paid to the writer in his Yards and Docks Department. That employee received only $900 a year, whereas Yards and Docks writers in other yards had salaries of $1017.25. Congress, however, did not alter this or any other rates of payment for Boston employees during the period.[94] Probably, workers at the navy yard benefitted from the stability of wages and salaries, since the depression of the mid-1890s lowered the cost of living.

In the years before the war with Spain, the eight-hour day prevailed at the Boston Navy Yard for manual workers. The precise hours of work shifted from season to season and sometimes from year to year. During the closing months of 1891, the morning bell rang at 7:15 a.m., and the closing bell at 4:15 p.m. According to the yard log, working hours changed on March 1, 1895 to 8:00 a.m. to 5:00 p.m. and on October 15 to 7:30 a.m. to 4:30 p.m. An hour-long break at noon was standard. Overtime seems to have been rare. Navy regulations of 1892 stipulated that for work in excess of eight hours, when performed between 6:00 a.m.

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93. Board on Wages to Commandant, Jul. 27, 1889, 181-123, Box 6; Semi-Annual Schedule of Wages, Dec. 1, 1897, 181-33, Box 49.

94. Chap. 640, Jun. 30, SAL, 1890, vol. XXVI, pp. 189-206; Chap. 386, Mar. 3, 1897, SAL, vol. XXIX, pp. 648-65; Civil Engineer to Commandant, Feb. 6, 1892, 181-33, Box. 43.

and 8:00 p.m, workers would be paid at the the usual rate. For night work, that is between 8:00 p.m. and 6:00 a.m, an overtime rate of time and a half was in effect.[95]

Boston Navy Yard employees received their wages during the noon hour on the fourth and twenty-fifth days of each month, unless those days fell on a Sunday, in which case payday was on the following Monday. Workers assembled by departments at the paymaster's office, were lined up by their foremen and quartermen in an order corresponding to the order of their names on the payroll, and then proceeded into the office. A warrant officer was on hand to witness the payment to each man. After the turn of the century, when the number of employees increased, workers were not all paid on the same day.[96]

Records concerning the performance and conduct of workers during the 1890s, at least prior to the Spanish-American War, are sketchy. In the first decade of the twentieth century, the chief problems involved workmen failing to appear, failing to appear on time, and failing to remain on the job until the final bell. The same circumstances probably were found in the 1890s. In November 1891, Commandant Thomas O. Selfridge issued an order prohibiting "per diem employees who remain away from the yard in the forenoon" from working in the afternoon of the same day, "except by special authority of the Commandant." Such a worker thus missed two musters, the morning muster, for which he failed to appear, and the after-dinner muster, which he was prohibited from

95. General Order, Nov. 16, 1891, 181-33, Box 43, vol. 53, p. 70 1/2; General Order 397, Jul. 22, 1892, 181-47, Box 2.

96. General Order, Apr. 11, 1891, 181-33, Box 3.

attending. An employee missing six consecutive musters was to be discharged

> unless it is shown that the absence is due to illness or other sufficient cause, and evidence of `such illness or other cause´ must be furnished to the head of the department before the employee has been absent six consecutive musters.

Workers were reminded by Commandant Miller in August 1895 and Commandant Henry L. Howison in June 1897 of the necessity for prompt submission of "evidence" of an excusable absence. Miller also directed that department clerks immediately report to department heads when an employee missed six musters in succession.[97]

In December 1895, J. H. Eldridge, foreman laborer in the Department of Yards and Docks, reported difficulties with two of his workers. James Grady, a teamster, was absent from six consecutive musters and therefore liable for discharge. Another Yards and Docks employee, stableman Harry Childs, appeared one morning, "bringing with him a man to do his work, he being too much intoxicated to perform the duties required himself." Apparently, the next muster Childs missed would be his sixth in a row.[98]

More important than absent teamsters and tipsy stablemen were incidents of technical incompetence, especially when the workman had charge of heavy and expensive machinery. Despite the reformed hiring procedures instituted in 1891, situations arose

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97. General Order, Nov. 16, 1891, 181-93, Box 43; General Orders, Aug. 17, 1895, and Jun. 11, 1897, both in 181-47, Box 3.

98. Eldridge to Capt. Philips, Dec. 7, 1895, and Dec. 11, 1895, both in 181-151, vol. for Aug. 1892-Apr. 1897.

of men assigned tasks exceeding their abilities. In March and again in August 1893, the dry dock pumping plant, which was operated by Construction and Repair, suffered damage because of the lack of a proper engine tender. At the time of the first incident, probably the docking of the yard tug Iwana, a first-class shipfitter, not an engine tender, had charge of the plant. When informed, the Chief of the Bureau of Construction and Repair held that the shipfitter could not be held "responsible for the accident, as he was not acting in the capacity in which he was employed." The bureau chief directed that "hereafter none but competent engine tenders be assigned to that duty." The second incident occurred probably on August 1 or 6, when Pilgrim, a commercial vessel, was being docked or undocked. A board investigating the damage to the plant recommended a "more skillful person to run the pumping machinery of the yard," and nominated Albert Sawyer, "whose name as Engine Tender stands first for employment on the yard register."[99]

Problems also arose with the personnel assigned to the new lighting plant, installed in late March 1895. The new facility fell under the authority of the Yards and Docks Department. Four months earlier, P. P. Crafts had been appointed by the Secretary of the Navy as electrician. In March, before the Navy accepted the plant, the yard hired men to operate it, including Granville Parks, rated as electrical machinist. While the contractor, General Electric, was giving the plant a test run, Parks received an opportunity to demonstrate his skill, or as it turned out, the

99. Chief, Bureau of Construction and Repair to Commandant, Apr. 8, 1893 and Aug. 31, 1895, both in 181-17, Box 18.

lack thereof.

Electrician Crafts stated that Parks, "having been given a fair trial...shows himself incompetent." The recently hired electrical machinist acknowledged "that he has never had experience as a fireman, which would prevent him from taking charge of a watch in a plant," since he could not give proper instructions to the firemen tending the boilers. "He also neglects his machinery, allowing the oil cups to get empty at times." Moreover, "from the manner in which he cares for machinery he seems to have little or no knowledge of operating engines and boilers or high potential lighting apparatus." Parks did not contest Crafts' report and resigned from the position. Crafts himself left a few months later.[100]

A final case of ineptitude among employees occurred in the manufacture by the chain forge of a cat and ground chain for the new cruiser Detroit. After delivery of the chain to the ship, a link broke, which produced an investigation by the Equipment Officer. That inquiry led to the workman who had produced the defective link. The Equipment Officer stated that the link had been made, "not by a regular chain maker but by a helper just rated as a chain maker and supposed to be a competent mechanic." A cat and ground chain for Marblehead had been made "under the same conditions," and the Equipment Officer recommended both chains be returned to the yard and new ones made. Upgrading helpers in any trade to Schedule B mechanics was permitted by

100. Crafts to Capt. Philips, Mar. 21, 1895, and Parks to Capt. Philips, Mar. 21, 1895, both in 181-151, vol. for Aug. 1892-Apr. 1897.

Navy regulations "when they have shown the necessary capacity..., as shown in a certificate from the head of the department...and when vacancies occur in that trade." This means that the Equipment Officer himself bore some of the responsibility for the defective chain.[101]

Doubtless, the introduction of Civil Service procedures in the 1890s had a wholesome effect on the Boston Navy Yard, and the episodes of employee incompetence were isolated incidents. However, it is also probably true that the impact of the reforms appeared in gradual rather than immediate fashion and that for a time there continued in use personnel standards and procedures that the twentieth century would consider casual.

INDUSTRIAL ACTIVITY: EQUIPMENT MANUFACTURING AND SHIP REPAIR

Throughout most of its history, the Boston Navy Yard functioned principally as a ship repair facility, its energies focused on vessels physically present in the yard. The years 1890 to 1897 were an exception, and the chief industrial activity consisted of the manufacture of items generally sent elsewhere for installation on vessels. The Departments of Steam Engineering and Construction and Repair engaged in such work only slightly, and the Department of Equipment performed the bulk of the manufacturing at the Boston yard. For much of the 1890s, the yard conformed to the orders of the Secretary of the Navy in 1886, which established the facility's central purpose as production of articles of equipment. The years before the

101. Equipment Officer to Commandant, May 13, 1893, 181-33, Box 8; New York Times, Jul. 22, 1892, p. 5.

Spanish-American War were slack times for the Departments of Construction and Repair and Steam Engineering, particularly the latter. Few warships came to the yard for repairs, and the little ship work that was performed centered on obsolete vessels, school ships, and yard craft.

In the 1890s, the Boston Navy Yard served as the Navy's major producer of several articles under the cognizance of the Bureau of Equipment. Six shops carried on the manufacturing: the ropewalk and wire rope mill; machine, galley, and foundry shop; anchor and chain shop; rolling mill; sail loft; and rigging loft.

The ropewalk, the only facility of its kind in the Navy, was the principal source of cordage for the fleet, vessels under construction, and shore establishments. Boston yard ropemakers produced large quantities of manila and hemp rope and a wide assortment of other cordage. For example, during the fiscal year 1893, production consisted of 270,810 pounds of hemp; 14,632 pounds of boltline; and 34,973 pounds of "marline, codline, hambroline, houseline, etc." The largest hemp rope produced at the yard measured twenty-four inches in circumference. An annex of the ropewalk, the wire rope mill, manufactured metallic cordage, most of it made of iron and steel and ranging in size from a quarter of an inch to six inches in circumference.[102]

In compliance with congressional directives and orders of the Navy Department in the 1880s, the Boston yard became the Navy's sole manufacture of anchor and chain. The chain shop made cables in six sizes between one and one-half inches and two and

102. ARND, 1893, p. 149.

one-quarter inches, as well as shackles, club links, and mooring swivels appropriate for each size. Chain making involved quality control procedures, and in producing one length in 1893, the shop tested the chain nine times.[103]

The same shop produced ship anchors weighing from 2500 to 6500 pounds as well as small anchors for boats. Obviously, the larger the vessel, the heavier the anchor required. In February 1892, the Equipment Officer listed anchors ordered by the Navy since July 1890. For the gunboat Petrel, the shop made two twenty-five pound anchors and one of sixty pounds; for a practice cruiser, one of 2500 pounds; for Ram No. 1, one of 2500 pounds; for Gunboat No. 5, one of 2700 pounds; for Cruiser No. 9, one of 4500 pounds; for Cincinnati, one of 6000 pounds; and one of twenty-five pounds for each of three tugs. Not completed were four other anchors, including one of 6500 pounds for Amphitrite.[104] Battleships required anchors of 13,000 pounds, which were procured by the Navy from private contractors.

The forge, anchor, and chain shop also produced anchor lashings, shank painters, marline spikes, grapnels, and clamps. In addition to fabricating new anchors, the shop altered and repaired old ones.[105]

Unlike the ropewalk and the forge, anchor, and chain shop, the other manufacturing units of the Boston Equipment Department

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103. Equipment Officer to Commandant, May 13, 1893, 181-18, Box 8.

104. Equipment Officer to Commandant, Feb. 2, 1892, 181-33, Box 43, vol. 53, p. 163.

105. ARND, 1899 (FSS #3912), p. 294; Equipment Officer to Commandant, Sep. 15, 1893, 181-18, Box 8, pp. 382-5.

were not unique to that yard. However, the machine, galley, and foundry shop did produce a large portion of the galleys needed for ships in commission as well as new ones under construction. Changes in navy rations and alterations in ship design required modification of galleys manufactured in the shop. In the late 1880s, a new galley was produced, more compact than previous models, but with a greater capacity for boiling, roasting, and frying. The new type also included a steam cooker. Other work performed by the shop consisted of repairs to galleys already in service and the manufacture of chain stud, metal scrapers, turnbuckles, punches, caps, and other miscellaneous articles.[106]

Some of the raw material for the metal-work shops at the Boston yard was provided by the rolling mill, also part of the Equipment Department. The mill bloomed and rolled scrap iron and steel to produce bar, round, and chain iron and forging billets. In 1893, the Chief of the Bureau of Equipment stated that the mill could supply all of the iron needed by his bureau, if the proper scrap could be obtained. In the following year, he noted that a shortage of iron for chain cables had been overcome by cutting up and rolling 230 tons of old ships´ tanks.[107]

Each of the nation´s navy yards included sail and rigging lofts, but the Boston sailmakers had a particular prominence in the late nineteenth century. In 1889, the Chief, Bureau of Equipment, observed that: "All sail and canvas work for the Navy, including that for new vessels building and in commission, has

106. ARND, 1890, p. 280.

107. ARND, 1893, p. 140; ARND, 1894, p. 162.

been done during the past year at Boston," except for vessels fitting out at Mare Island. Within a few years, the sail lofts at New York and Norfolk relieved Boston of part of the burden of providing canvas for the fleet.[108]

The variety of goods produced by the sail loft in the Boston yard is manifest in a listing of canvas work for Machias, a gunboat under construction at Bath, Maine. The list contains thirty-five categories of items in various quantities, including ship awnings and awning curtains; bags for clothes, hammocks, pea jackets, mess gear, and coal; hammock cloths and hammock numbers; cabin, wardroom, and hospital cots; covers for binnacles, skylights, capstans, sails, wheels, reels, and windbreaks; and screens for coal, ladders, galleys, and topgallant forecastles. The yard's Equipment Officer requested authority to send the master sailmaker and his leadingman to Bath to take measurements of Machias. Another new ship, Castine, required an identical canvas outfit.[109]

Articles manufactured by the Equipment Department and intended for vessels not at the yard were delivered by other ships or sent by rail. Fern served the Navy as delivery vessel and frequently visited the Boston yard to take on Equipment shipments. Goods destined for the West Coast went by rail. Each month, the yard's General Storekeeper prepared a statement of shipments sent from the yard "over land grant or bonded railroads." Most of these shipments consisted of products of the

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108. ARND, 1889, p. 186; ARND, 1892, p. 125.

109. Equipment Officer to Commandant, Sep. 25, 1893, 181-18, Box 8, pp. 382-5.

Equipment Department. To cite a particular instance, in January 1897, the GSK reported five rail shipments. Two consisted of cordage for Mare Island, and each of the others were bales of clothes bags for Marion at San Francisco and for two California shore establishments.[110]

During most of the 1890s, activity in the Department of Equipment at the Boston Navy Yard responded to a different tempo than did other departments, since it was producing articles for new ships then being built, such as Machias and Castine. Other ships under construction and receiving Boston-made equipment were Marblehead, Illinois, Oregon, Texas, Massachusetts, Maine, Olympia, and Indiana.[111]

Within a few years, the enlargement of the fleet would activate the somewhat moribund Departments of Construction and Repair and Steam Engineering at the Boston Navy Yard. According to the Secretary of the Navy in 1889, the policy was to have ships constructed by private shipbuilding firms, using navy yards for new construction only in limited fashion. At that time, ships were being built in three navy yards, Norfolk, Brooklyn, and Mare Island. The only other yard considered capable of new construction was Portsmouth, and that solely for wooden vessels. An act of Congress in 1882 had more or less closed the remaining yards respecting both construction and repair of vessels. Those yards were Boston, League Island, and Washington. In 1889, the

110. Bureau of Equipment to Commandant, Feb. 5, 1895, 181-19, Box 29; GSK to Commandant, Jan. 31, 1897, 181-33, Box 49.

111. Equipment Officer to Commandant, Aug. 30, 1893, 181-18, Box 8; Equipment Officer to Commandant, Dec. 2, 1892, 181-18, Box 8; Equipment Officer to Commandant, Oct. 3, 1894, 181-18, Box 29.

Secretary of the Navy indirectly recommended improvements at Boston and League Island to enable them to work on ships. However, he also noted that the "yards referred to must remain closed until the law shall reopen them."[112]

In the 1890s, Congress did not explicitly change "the law." But in the naval appropriations bill of June 1890, it authorized the expenditure of $90,000 for improving the Boston Navy Yard to enable it to repair up-to-date vessels and marine machinery. Those funds, while inadequate to modernize the yard, did manifest a desire to reestablish Boston as a bona fide repair facility. The most striking evidence of a congressional decision to "reopen" the yard was approval in May 1898 for the construction at Boston of a new seven hundred-foot dry dock. However, prior to 1898, the volume of ship work required of the yard was modest, if not slight.

Throughout most of the 1890s, the Boston Navy Yard frequently repaired vessels which were attached to the yard, were school ships, or which often came to the yard bringing goods, personnel, or messages. The tugs Iwana and Rocket were assigned to the yard, as was the receiving ship Wabash. Several other vessels were more or less permanently berthed in the area, on loan from the Navy for training purposes. The naval militia of the State of Massachusetts, from 1892 to 1896, had use of the monitor Passaic, originally commissioned in 1862. The yard was under orders to maintain the vessel in condition to be deployed at any time for harbor defense. In July 1896, the Navy

112. ARND, 1889, pp. 14-15, 27.

transferred Passaic to the naval militia of Georgia. Minnesota, a pre-Civil War steam frigate, was also under loan to the Massachusetts naval militia. Enterprise, a bark-rigged sloop built in 1877, had been turned over to the city of Boston for the benefit of the Massachusetts Nautical Training School. In mid-1897, yet another militia vessel arrived at the yard. This was Yantic, being readied to proceed to Erie, Pennsylvania, to be transferred to the naval militia of Michigan. Finally, among the yard's regulars were three vessels whose assignment required them to sail from one East Coast shore installation to another. Fern and Fortune transported freight, and Dolphin, dispatches and personnel. Essentially, yard craft, militia ships, and Navy dispatch and transport vessels provided repair work for the Boston Navy Yard, 1890-1897.[113]

One index of the volume and kind of activity found at the Boston Navy Yard is the number and type of vessels entering the dry dock. Construction and Repair had authority over the dock, and ships were docked and undocked under its auspices. Between the first of January 1890 and the end of December 1897, there were sixty-four dockings, some vessels being docked more than once. Even had all of these involved warships, the volume of activity appears small compared with the early twentieth century. In fact, almost half of the dockings were of vessels not belonging to the Navy and not under repair by the yard. Rather,

113. Bureau of Steam Engineering to Commandant, June 24, 1892, and Oct. 7, 1893, both in 181-27, Box 5; Bureau of Steam Engineering to Commandant, June 1896, 181-27, Box 6; Bureau of Construction and Repair to Commandant, Jul. 1, 1896, 181-17, Box 10; Bureau of Construction and Repair to Commandant, Feb. 23, 1893, 181-17, Box 18.

they were privately owned ships, being repaired by private firms.[114]

Navy policy permitted ship owners to use the dock and have their vessels worked on by private ship repair establishments. Thirty dockings during the period were of commercial vessels, at least twenty-two of them under repair by the Atlantic Works of East Boston. Approval of the Department of the Navy, generally acting on the recommendation of the Bureau of Construction and Repair, was required for the docking of private vessels. The Department granted permission on condition that no expenses be borne by the Navy. When a ship was in distress or when her size exceeded the capacity of commercial docks in the area, the Navy charged the owner or repair firm only for the expense of docking, that is the cost of navy yard labor, fuel for the pumping plant, and material. So long as the vessels left the dock within two working days, no "lay day" fees were imposed. Beyond two days, a per diem rate was charged, based on the ship's tonnage. The vessel's owner or the repair company could use yard workmen in the actual work on the ship, reimbursing the Navy at the rate found in the current wage schedule.

During 1890 and 1891, ships under the repair of the Atlantic Works entered the Boston yard dry dock four times more frequently than did naval vessel. By allowing the Atlantic Works and others to use the dock, the Navy gained the good will of such parties and received revenues from lay day charges. The docking of the

114. Bureau of Construction and Repair to Commandant, Apr. 3, 1896, 181-17, Box 20. The most informative document in studying use of the dry dock is the Docking Log, 181-60.

1702-ton schooner Atlas illustrates the system for docking private vessels.

Atlas entered the dock on August 9, 1890, a Saturday and thus a half holiday for the yard. It remained docked until the following Saturday, August 16. Fifty-two yard employees were engaged in the docking, undocking, and actual repair of the ship. Each of the fifty-two worked from six and one-half to seven and one-half days. The force consisted of thirteen shipwrights, three joiners, nineteen laborers, and one each of the following ratings: engineer, fireman, tool keeper, leadingman laborer, and teamster. Also on the scene was the Construction and Repair general foreman. The bill submitted to the Atlantic Works included a charge of $759.39 for yard labor, $132.45 of which was for overtime work, possibly on Saturday afternoon or Sunday. No charge was assessed for the services of the general foreman. In addition, the company paid $96.35 for eight tons of coal and eleven hundred feet of yellow pine planking. Since Atlas remained in dock beyond two regular working days, another item was a lay day charge for three and a half working days at ten cents per ton for each full day and fifteen cents for the half day. This came to $893.53, the total bill being $1749.17.[115]

Since only five naval vessels were docked in the years 1890 and 1891 as compared with twenty-two ships under repair by the Atlantic Works, quite clearly the practice of docking private ships enabled the yard to maintain some semblance of a dry dock work force. Yard administrators constantly worried that when a

115. Docking Log, 181-60, p. 93; General Foreman to Commandant, Aug. 10, 1890, 181-33.

naval vessel arrived in need of repairs, sufficient capable mechanics might not be on hand to do the work. Docking of commercial ships prevented some men from being laid off and seeking permanent employment elsewhere.

The maintenance of friendly, working relations with private ship repair companies in the area proved particularly advantageous to the Navy in times of vastly increased work on naval vessels, such as during the Spanish-American War. Then, the Boston yard made arrangements with commercial firms to handle ship work exceeding its own capability.

Of the thirty-four dockings of naval vessels at the Boston Navy Yard from 1890 to 1897, twenty-two involved the yard tugs and Passaic, Enterprise, Fortune, and the dock's own caisson. Iwana entered the dock seven times, and Passaic and Enterprise five times each.

As with commercial vessels, ships of the Navy were docked on directions from Washington, Generally, those directions authorized docking and an inspection of the ship's bottom by a board of yard officers. That board reported its findings and recommendations to the Bureau of Construction and Repair. The bureau maintained records of the dockings of each ship and the work done. Thus, it had some idea of the condition of a ship's bottom. Usually the bureau approved the recommendations of the yard board and authorized the work to be carried out forthwith.

Dry-docking ships became more frequent as metal replaced wood in hull construction, because iron and steel were more susceptible to fouling. A badly fouled bottom, with abundant barnacles and sea grass, greatly reduced speed and increased fuel

consumption. Ships' crews could render only limited maintenance to underwater exteriors. The best remedy was periodic dockings, usually twice a year, during which the bottom could be cleaned and treated with antifouling paints.

Vesuvius, an experimental dynamite-gunboat built in 1890, was dry-docked twice at Boston during the years 1890-1897. Prior to her first arrival in July 1894, the Bureau of Construction and Repair sent instructions to the yard to dock and examine the vessel and make recommendations as to painting. The ship entered the dock on July 19, and a "Paint Board" immediately made its examination and sent a report to Washington. On July 23, the bureau approved the recommendations and telegraphed orders "to have the bottom of the vessel thoroughly cleaned, touched up where needed with red lead, and the whole bottom painted with a coat of McInnes paint, as recommended." Vesuvius remained in dock until August 2, during which time the work on her bottom was performed and other repairs made.[116]

Ships' crews, especially of smaller vessels such as Vesuvius, were expected to do maintenance work on the hull at the water line and, when possible, to underwater portions. While at Florida in June 1897, Vesuvius received such maintenance. When the ship was listed, extensive but not serious pitting was found at the water line. This was repaired by scraping down to the bare hull and then red-leading and painting. Small barnacles and grass thickly covered the bottom. The crew scraped the bottom as

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116. Bureau of Construction and Repair to Commandant, Jul. 12, 1894, and Jul. 13, 1894, both in 181-17, Box 18; Docking Log, 181-60.

Table No. 1: DRY-DOCKINGS, BOSTON NAVY YARD, 1890-1897

In	Out	Name of Vessel	Type	Repaired By
1890				
Apr 7	Apr 21	Fortune	Tug, USN	Boston N. Yard
May 1	May 3	Marseille	Steamer	Atlantic Works
May 6	May 8	Orion	Steamer	Atlantic Works
Jun 3	Jun 4	Gwent	Steamer	Atlantic Works
Jun 30	Jul 21	City of Macon	Steamer	Atlantic Works
Jul 8	Jul 10	Gate City	Steamer	Atlantic Works
Jul 16	Jul 17	Rowena	Steamer	Atlantic Works
Jul 17	Jul 23	Marmion	Steamer	Atlantic Works
Jul 23	Jul 24	Maria Stoneman	Bark	Atlantic Works
Jul 19	Jul 30	Annie Bingay	Bark	Atlantic Works
Aug 9	Aug 16	Atlas	Schooner	Atlantic Works
Aug 18	Aug 21	Petrel	Gunboat, USN	Boston N. Yard
Aug 23	Aug 29	Cushing	Torpedo Boat, USN	Boston N. Yard
Aug 23	Aug 29	Rocket	Tug, USN	Boston N. Yard
Sep 2	Sep 20	Sama	Steamer	Atlantic Works
Sep 25	Sep 27	John S. Ames	Schooner	Atlantic Works
Sep 29	Sep 30	Kennard	Bark	Atlantic Works
Oct 6	Oct 9	Loanda	Steamer	Atlantic Works
Oct 9	Oct 15	Shawmut	Steamer	Atlantic Works
Nov 20	Nov 29	Minia	Cable Steamer	Atlantic Works
Dec 19	Dec 22	Samara	Steamer	Atlantic Works
1891				
Jan 2	Jan 29	Nyassa	Steamer	Atlantic Works
Feb 6	Feb 12	Wilkes Barre	Steamer	Atlantic Works
Apr 4	Apr 8	City of Savannah	Steamer	Atlantic Works
Apr 18	Apr 21	City of Macon	Steamer	Atlantic Works
Apr 23	Apr 25	Trafalgar	Iron Ship	Atlantic Works
Oct 31	Nov 6	Newark	Cruiser, USN	Boston N. Yard
1892				
Jun 20	Jul 2	Concord	Gunboat, USN	Boston N. Yard
Aug 22	Aug 31	Passaic	Monitor, USN	Boston N. Yard
Oct 1	Nov 10	Enterprise	Screw sloop, USN	Boston N. Yard
Nov 11	Dec 13	Britannia	Steamer	
Dec 17	Dec 23	Caisson	USN	Boston N. Yard
Dec 23	Mar 25	Enterprise	Screw sloop, USN	Boston N. Yard

Table 1: Dry-Dockings, Boston Navy Yard, 1890-1896 (continued)

In	Out	Name of Vessel	Type	Repaired By
1893				
Mar 29	Apr 7	Iwana	Tug, USN	Boston N. Yard
Mar 29	Apr 7	Caisson	USN	Boston N. Yard
Aug 1	Aug 6	Pilgrim	Yacht	
Aug 30	Sep 5	Pilgrim	Yacht	
Oct 12	Oct 25	Iwana	Tug, USN	Boston N. Yard
Oct 27	Nov 27	Passaic	Monitor, USN	Boston N. Yard
Nov 16	Nov 23	Pilgrim	Yacht	
1894				
May 3	May 9	Enterprise	Screw sloop, USN	Boston N. Yard
Jun 30	Jul 2	Passaic	Monitor, USN	Boston N. Yard
Jul 19	Aug 2	Vesuvius	Gunboat, USN	Boston N. Yard
1895				
Jan 25	Mar 19	Katahdin	Ram	Bath Iron
Apr 8	Apr 15	Caisson	USN	Boston N. Yard
Apr 22	Apr 29	Enterprise	Screw sloop, USN	Boston N. Yard
May 1	May 14	Iwana	Tug, USN	Boston N. Yard
Jul 19	Jul 26	Passaic	Monitor, USN	Boston N. Yard
Sep 21	Oct 24	Katahdin	Ram	Bath Iron
1896				
Apr 9	Apr 21	Minia	Cable Steamer	Atlantic Works
	May 18	Iwana	Tug, USN	Boston N. Yard
Jun 19	Jun 29	Passaic	Monitor, USN	Boston N. Yard
Jul 28	Jul 30	Tinto Hill	Sailing Vessel	
Aug 31	Sep 16	Iwana	Tug, USN	Boston N. Yard
1897				
Apr 15	Apr 27	Robert Carter	Schooner	Owner
Apr 29	May 8	Enterprise	Screw sloop, USN	Boston N. Yard
May 10	May 18	Iwana	Tug, USN	Boston N. Yard
May 18	Jun 1	Robert Carter	Schooner	Owner
Jul 9	Jul 13	Marblehead	Cruiser, USN	Boston N. Yard
Jul 19	Jul 28	Yantic	Screw gunboat, USN	Boston N. Yard
Aug 3	Aug 18	Vesuvius	Gunboat, USN	Boston N. Yard
Sep 3	Sep 9	Iwana	Tug, USN	Boston N. Yard
Sep 11	Oct 12	Yantic	Screw gunboat, USN	Boston N. Yard
Nov 29	Mar 21	Lancaster	Screw sloop, USN	Boston N. Yard

(SOURCE: Docking Log, 181-60)

well as they could, using shovels lashed to poles. An account of these repairs was sent to Washington, which decided to order the ship a second time to Boston for docking and repairs.[117] The incident indicates that there existed no substitute for regular dry-docking.

Of those departments of the Boston Navy Yard engaged in manufacturing and ship work, Steam Engineering appears as the least active. In the years 1890-1897, it generally made only minor repairs to the machinery of vessels. During some months, it performed no work of any kind on ships. Maintenance of the department's machine tools consumed most of its energies and funds. For example, in September 1890, "care and preservation of tools and machinery" consumed $447.12; "care and handling of stores," $48.00; and the sole ship repair task, work on the boiler of Cushing, $35.68. During the entire fiscal year of 1890, the department expended $141.12 on repair of five vessels and $5119.24 for care of its tools. As a matter of fact, almost three times the amount spent on ship repairs was used to run and repair the engine and boiler in the machine shop.[118]

Of the period covered in this report, probably fiscal 1890 represents the nadir for the Department of Steam Engineering, because of the slight nature of its repairs to ships. Work on

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117. Board of Officers to Commandant, Jun. 30, 1897, 181-17, Box 21; Bureau of Construction and Repair to Commandant, Jul. 20, 1897, 181-17, Box 20.

118. As examples of the inactivity in Steam Engineering, see Monthly Reports, dated Nov. 30, 1890; Mar. 31, 1891; Jul. 31, 1891; and Oct. 10, 1891, all in 181-112, vol. for Jul. 7, 1890-Jul. 20, 1893. pp. 72, 112, 153, 179; Assistant Engineer to Commandant, Aug. 14, 1890, 181-112, vol. for Jul. 7, 1890-Jul. 20, 1893, pp. 19-31.

the five ships and the costs of labor and material consisted of the following: Boston, "repairs to engine bolts," $12,70; Yorktown, "repairs to siren whistle," $33.86; Fortune, "forging and boring bell crank lever," $36.48; Wabash, " heating iron in auxiliary boiler," $2.00; and Rocket, "repair to boiler (water legs)," $15.92.[119]

During the early 1890s, ships whose machinery received the most extensive repairs at Boston, other than the yard tugs and militia ships, were Newark and Concord. Steam Engineering also did work on Narkeeta, Wahneta, Vesuvius, and Dolphin.

The largest and probably the most important ship upon which the Boston Navy Yard made more than incidental repairs prior to the Spanish-American War was the protected cruiser Newark, regarded as the first modern cruiser in the American fleet. Built by William Cramp and Sons of Philadelphia, and commissioned early in 1891, she operated off the Atlantic Coast until October, when ordered to the Boston yard. Prior to her arrival, the yard received a list of repairs recommended by the ship's captain. On October 28, shortly after Newark's arrival, boards of yard officers from Steam Engineering and Construction and Repair surveyed the vessel and produced a list of forty-six specific repairs needed. Commandant Selfridge issued a general order requiring each department head to submit daily a report of the progress of work. The order also directed them to "exercise such personal superintendence as will insure faithful and steady

119. Assistant Engineer to Commandant, Aug. 14, 1890, 181-112, vol. for Jul. 7, 1890-Jul. 20, 1893, pp. 29-31.

application until the bell rings."[120]

Newark entered the dry dock on October 31 and remained for a week, during which the bottom was cleaned and painted. In addition, Construction and Repair workers repaired the tiller, tiller room, and chain lockers; calked the deck; patched deck planks; converted a ward bathroom into a storeroom; and made some seventeen other repairs. Steam Engineering work included repairing, overhauling, or servicing reversing engine, valves, tank vapor pipe, overflow tank, flushing pump and pipes, and a dozen other items. Steam Engineering contracted with three private machine shops in the area for some of the work.

The ship left the dry dock on November 6, and by November 14, all work was completed. Since the ship had been commissioned only nine months earlier, the repairs undertaken at the Boston Navy Yard appear in the nature of post-shakedown work. In the following month, Newark entered Norfolk Navy Yard, where she remained for three months, undergoing further and more extensive repairs.[121]

The Boston Navy Yard did minor work on three new Navy tugs, in connection with their acceptance from a private shipbuilding firm in the area. In 1892, City Point Iron Works of Boston, completed three tugs for the Navy. Narkeeta, launched February 11, 1891, was delivered to and accepted by the Navy at the Boston

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120. General Order No. 3, Nov. 3, 1891, 181-33, Box 43.

121. DANFS, vol. V, pp. 72-3; Bureau of Steam Engineering to Commandant, Oct. 22, 1891, 181-27, Box 5; Chief Engineer to Commandant, Nov. 4, 1891; Naval Constructor to Commandant, Nov. 4, 1891 and Nov. 5, 1891, all in 181-33, Box 42; Docking Log, 181-60.

PHOTOTOGRAPH NO. 1: USS Amphitrite at Boston Navy Yard in the late 1890s.

yard on March 12. She was commissioned April 24. Shortly thereafter, the process was repeated for Wahneta and Iwana. Following commissioning, Narkeeta steamed to her assignment at the New York Navy Yard, and Wahneta to the Norfolk yard. Iwana remained at the Boston yard, beginning her lengthy career there, which lasted more than a half century.[122]

Katadhin, unlike the three tugs, arrived at the yard not yet ready for delivery to the Navy. Launched in February 1893, her builders, Bath Iron Works, made arrangements with the Navy for docking of the vessel at Boston in 1895. A harbor defense ram, Katadhin testified to the persistent attraction of ramming as an effective offensive maneuver against enemy ships. Constructed to ride extremely low in the water, the ship's hull had several features subsequently employed in early submarines. In docking Katadhin in the Boston dry dock, the same arrangements respecting costs prevailed as in the case of non-naval vessels being worked on by private firms. The ship remained in dock from January 25 to March 19, during which time the contractor worked on the vessel. Katadhin was again docked in the fall of 1895. Subsequently, the ram left for New York Navy Yard, where she was commissioned in February 1896.[123]

During the summer and early fall of 1897, activity in the repair departments of the Boston Navy Yard increased, largely because of the work required on Vesuvius, Yantic, Marblehead, and

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122. DANFS, vol. III, p. 471; vol. V, p. 12; vol. VII, p. 28.

123. DANFS, vol. III, pp. 602-3; Docking Log, 181-60; Commandant to Bureau of Construction and Repair, Feb. 27, 1895 and Mar. 29, 1895, both in 181-16, Box 9.

Newport The first three were dry-docked, Yantic twice. Vesuvius probably received more extensive repairs than any other active warship coming to the yard in the period 1890 to 1897. Work on Vesuvius by Steam Engineering involved repairs or overhaul of engines, boilers, blowers, pumps, condensers, fire room bulkhead, and distillers. Construction and Repair workmen, in addition to routine work in dry dock, built a pilothouse, modified the ventilating system, repaired door and skylight hardware, manufactured an easy chair for the captain's cabin, and painted the officers' dining room.[124]

Marblehead, an unarmored cruiser commissioned in 1894, served with the North Atlantic Squadron, and throughout most of 1897 cruised the East Coast and the Caribbean. The ship arrived at the Boston Navy Yard in early July 1897 for a routine docking. Other work consisted of repairs to the pilothouse and shutters. Marblehead left the yard in mid-July to resume her duties in the Atlantic.[125]

Shortly following the departure of the cruiser, work began on Yantic, a wooden-hulled screw gunboat built during the Civil War. After three decades of "showing the flag" throughout Asia and in waters off North, Central, and South America, Yantic was

124. Bureau of Steam Engineering to Commandant, Jul. 2, 1897, 181-27, Box 6; Bureau of Construction and Repair to Commandant, Jul. 13, 1897, 181-17, Box 20; Commandant to Bureau of Construction and Repair, Aug. 5, 1897, 181-16, Box 9; Naval Constructor to Commandant, Aug. 7, 1897, Aug. 17, 1897, Sep. 4, 1897, Oct. 2, 1897, all in 181-16, Box 9.

125. Docking Log, 181-60; DANFS, vol. IV, p. 229; Bureau of Construction and Repair to Commandant, Jul. 3, 1897 and Jul. 13, 1897, both in 181-17, Box 20, vol. for Oct. 10, 1896-Jul. 28, 1897, pp. 79, 86.

being prepared for use by the Michigan naval militia. The ship occupied the dry dock during ten days in July and thirty-one days in September and October. Construction and Repair mechanics and laborers repaired and calked the hull and worked on spars, boats, and furniture.[126]

The Boston Navy Yard provided a different kind of service to Newport. This was a spanking new gunboat, built by Bath Iron Works. She arrived at the yard early in October 1897 for the purpose of being fitted out. Generally, builders delivered vessels structurally complete and with machinery in working order. What remained was providing, and if need be installing, all of the equipment, implements, and paraphernalia required to make ships operational and liveable. The Departments of Construction and Repair, Steam Engineering, and Equipment participated in the outfitting of Newport.

Included in the activities of Construction and Repair were the following: fitting out water closets, washrooms, sick bay and dispensary, prison, ordnance room and engineer's log room, cadets' lavatory, pantries, and fireman's washroom; fitting out and stowing water tanks and mess tables; cementing all water closets and washrooms; completing cadets' lockers; fitting and securing furniture; storing anchors and gratings; putting in jack rods for weather cloths; and painting the interior of the ship. To Steam Engineering fell the tasks of providing and properly stowing or securing all of the tools needed for the vessel's

126. DANFS, vol. VIII, pp. 516-7; Naval Constructor to Commandant, Oct. 2, 1897, 181-16, Box 9; Bureau of Construction and Repair to Commandant, Jun. 17, 1897, 181-17, Box 20.

machinery workshop. The department also modified the galley funnel. The yard faced a deadline, since Newport was to be commissioned on October 15 and had orders to depart the same day for a shakedown cruise in the Caribbean.[127]

At the end of 1897, two pre-Civil War vessels entered the yard. From Portsmouth, where she had been a receiving ship, Constitution was towed to Boston to celebrate her centennial, having been launched on October 21, 1797, at Hartt's Shipyard, across the harbor from the future Charlestown Navy Yard. Constitution remained in decommissioned status. In November, Lancaster arrived. A steam sloop, originally commissioned in 1859, Lancaster had sailed from Montivedeo, where she had served as flagship of the South Atlantic Squadron. On December 31, the ship went out of commission and spent the winter in dry dock. Some repairs were made on both Lancaster and Constitution.

During 1897, the Boston Navy Yard rendered repairs and services to a small, highly diverse assortment of ships. The wooden hulls and tall masts of Constitution, Yantic, and Lancaster contrasted starkly with the low profile and metal hulls of Vesuvius, Marblehead, and Newport. Although the demands on the yard grew in the summer, requiring the hiring of additional labor, 1897 generally reflected the ship repair activities of the yard during the previous seven years. From 1890 to 1897, the Boston Navy Yard repaired or outfitted twenty-five naval ships. Eleven of them, all built in the 1880s or 1890s, were ships of

127. DANFS, vol. V, p. 77; Bureau of Steam Engineering to Commandant, Sep. 16, 1897 and Sep. 18, 1897, 181-88, Box 6; Naval Constructor to Commandant, Oct. 10, 1897, 181-16, Box 20.

war and parts of the Navy's active fleet. Work on these vessels generally included routine docking and "slight," "small," or otherwise limited repairs. Seven tugs and small navy transports also received the attention of the yard, two of them, Iwana and Rocket, being frequently under repair. Regular or substantial repairs were made on Enterprise, Passaic, and Yantic, which, along with Minnesota, were school or militia ships. Finally, the yard had become home to three ships of yesteryear, Wabash, Lancaster, and Constitution. That the Boston Navy yard was still in its post-Civil War, nineteenth-century stage becomes evident through a comparison with any single year of the early twentieth century. In 1906, for example, the yard worked on at least forty vessels, including twenty battleships and cruisers, fifteen of which received major repairs or overhauls. The Spanish-American War marked the transformation of the yard to a more active facility.

Chapter II

THE BOSTON NAVY YARD AND THE WAR WITH SPAIN, 1898-1899

However brief, the "Splendid Little War" with Spain in 1898 had great impact on America and world politics, converting the republic into an empire with insular possessions in the Caribbean and, more significantly, in the Pacific and off the Asian mainland. Domestically, the war marked the end of a period of economic hard times, social and psychic unrest, and third-party revolt. In the short run, the war provided the Navy an opportunity to test its warships, fleet organization, and logistics. The long-range impact on the Navy included the challenge of defending the Philippines and the possibility of struggle with Japan.

The Spanish-American War helped reestablish the Boston Navy Yard as a functioning ship repair facility, particularly resurrecting the Departments of Construction and Repair and Steam Engineering. In the years of 1898 and 1899, the yard worked on almost fifty naval vessels, thirty-six of which entered dry dock. The increased volume of work necessitated an enlarged labor force. At the height of its wartime activity, the yard employed in excess of 1500 men. The aftermath of the war saw the inevitable reduction in force, but the employment levels never returned to the small numbers characteristic of the yard in the earlier part of the 1890s. Although, there were no structural alterations in the yard's administration, the officers expanded

in number, and shops, previously nonexisting or barely visible, emerged as concrete and permanent entities. During the war, important decisions were made respecting the yard's plant.

The crisis with Spain early in 1898 produced among the inhabitants of the Atlantic seaboard a state of high excitement, described by Theodore Roosevelt as an hysteria. Wild rumors circulated about the imminence of an assault upon that coast by Spanish naval forces. Congressmen and governors responded to their constituents' pleas for protection and applied pressure on the Navy to provide for the defense of port cities.[1] Rather than commit its regular warships to such duty, the Navy created the "mosquito fleet" or Auxiliary Defense Fleet, consisting of monitors, converted yachts, and other obsolete or small craft. The Boston Navy Yard worked on a dozen vessels assigned to the mosquito fleet.

Given the difficulties the Spanish experienced in getting their ships to Cuba, both the fear of an attack on the East Coast and the preparations to cope with it seem excessive. Had Spanish naval units approached New England and been detected by the North Patrol Squadron, composed of genuine warships, the Boston Navy Yard would have been the first shore installation to receive word. Commanding officers of that squadron's ships had orders on sighting the enemy to notify the yard immediately, so that the commandant could alert other military officials as well as

1. Theodore Roosevelt, An Autobiography (New York: Charles Scribner's Sons, 1913), pp. 214-7.

civilian authorities in the vicinity.[2]

CHANGES IN THE YARD'S ROUTINE AND RESPONSIBILITIES

The coming of war was manifest in a variety of ways at the Boston Navy Yard, one being the closing of the yard to the public. Previously, the facility was open to visitors during normal working hours. No pass was required, and visitors could even enter shops and observe operations at close range. After the sinking of Maine on February 15, 1898, nearly everyone anticipated war, and popular excitement led to an increase in yard visitors, eager to witness preparations for the contest. This had several unfortunate consequences. On March 26, a child accidentally fell into the dry dock, "miraculously coming out alive." The docking log indicates a vessel did not occupy the dock at the time, so that it can be assumed to have been flooded. In addition to the possibility of other such accidents, the number of visitors became so great in some shops as to "seriously incommode the workmen and impede the progress of work." Moreover, as usual during military crises, fears arose about espionage and sabotage. In early April, Commandant Henry L. Howison received information "of a suspicious circumstance of two men and a woman and a carriage being seen near the Nitre Depot, and a remark heard of a meeting at the Navy Yard." Another factor was the departure of a large segment of the resident Marine Corps detachment, which provided guards for the yard's security force. As a consequence of these considerations,

2. Commandant to Commodore Howell, May 13, 1898, 181-5, Box 21.

Commandant Howison ordered that: "Commencing Monday, April 11, 1898, visitors will not be admitted to the Navy Yard, except on business, or as guests of the families residing in the yard."[3]

The war produced additional chores for yard officers, beyond oversight of an increased labor force working on a larger number of ships. As the major naval and military establishment in New England, the Boston Navy Yard received letters from local inhabitants concerning personal matters relating to the war. Commodore Howison responded to a number of inquiries made by residents about husbands, sons, or brothers feared to be on Maine, when it exploded in Havana Harbor in February. Howison politely referred such correspondents to the Bureau of Navigation in Washington. Other individuals, moved by patriotism, sought information about military service. A woman from Attleboro wrote the yard, expressing her desire to become a nurse in the Navy.[4]

If, in the spring of 1898, there were too many visitors in the Boston yard, there were also too few officers of certain types in the Navy. A shortage of engineering officers quickly developed. As a remedy, qualified civilians were recruited for temporary service. Boards composed of permanent members of the Engineer Corps examined men seeking such appointments. In late

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3. Commandant to Professor Albert Kingsbury, Mar. 3, 1898; Commandant, Memorandum for the Captain of Yard and Commanding Marine Officer, Mar. 26, 1898; Commandant to Board of Police, Boston, Apr. 8, 1898; Commandant to Gunner Granger, Nitre Depot, Apr. 11, 1898; Commandant to Hon. Frederick Dallinger, Apr. 18, 1898, all in 181-5, Box 21; Equipment Officer to Commandant, Apr. 9, 1898, 181-33, Box 49; Commandant, Order, Apr. 8, 1898, 181-45, Box 13.

4. For an example of letters concerning Maine, see Commandant to Mrs. M. E. Harty, Mar. 3, 1898, 181-5, Box 21. Commandant to Miss A. L. Eller, Mar, 5, 1898, 181-5, Box 21.

April, Commandant Howison created such a board at the Boston yard, consisting of two and later three officers from the Steam Engineering Department and from Wabash.[5]

Officers at the yard participated in recruitment of another type of personnel. To provide manpower for the Auxiliary Defense Fleet, the Navy sought to mobilize members of the naval militia. The Secretary of the Navy ordered, through the commandant of the Boston yard, an inspection of Minnesota, assigned before the war to the Massachusetts naval militia. Required was information concerning the number of men which could be berthed, messed, and accomodated on the vessel, to be used as a receiving ship for local naval militia.

To enlist naval militia further afield, the commandant employed captains of vessels in the yard being prepared for service in the Auxiliary Defense Fleet and in need of officers and crew. Howison directed Lt. John B. Milton, commander of Wyandotte, a monitor under repair, to proceed to Augusta, Maine, and then to Bath to confer with Maine militia authorities respecting the enlistment of men and the appointment of officers for his ship. Such men Lieutenant Milton regarded as acceptable were to be forwarded to Wabash at the Boston Navy Yard for further examination and processing.[6]

In addition to crews for the Auxiliary Defense Fleet, the Navy also needed vessels to supplement existing ships suitable

5. Commandant to Chief Engineer, Apr. 30, 1898; Commandant to Chief Engineer, May 9, 1898, both in 181-5, Box 21.

6. Secretary of Navy to Commandant, May 8, 1898; Commandant to Lt. Milton, May 23, 1898, both in 181-5, Box 21.

for protecting ports, such as Wyandotte. Furthermore, there was desperate need of colliers and other auxiliaries. To enlarge the fleet rapidly, the Navy purchased vessels in private hands and took over ships in the custody of other government agencies.

The Navy created a Board on Auxiliary Vessels, headquartered in New York City, which coordinated and directed the search for, inspection of, and, in the case of a privately owned ship, the purchase of vessels. These activities involved officers of navy yards. The 129-foot yacht Illawara serves as an illustration of the procedure. On March 25, two officers, apparently not directly connected with the Boston yard, inspected the yacht in Boston Harbor, and one of them recommended against purchase "at present," because her engines and boilers lacked an evaporator and had only a small fresh water tank. Despite these deficiencies, several weeks later the President of the Board on Auxiliary Vessels made an offer to the owner of Illawara for $55,000. The owner immediately agreed and delivered the vessel to the Boston yard, where she was accepted by the commandant. The commandant created a board of yard officers to examine the yacht and determine what had to be done to fit her as a gunboat.[7]

In other instances, officers of the yard were ordered to make the initial examination. The steamer Prince Edward apparently sailed from Boston's Long Wharf before the three-man board from the yard had an opportunity to determine her suitability as an auxiliary cruiser. Chief Engineer Alfred Adamson and Naval Constructor Joseph Feaster received directions

7. President of the Board to Commandant, Apr. 26, 1898, 181-123, Box 6.

to participate in the examination of craft of the Boston Lighthouse District to ascertain whether any of them were suitable for the mosquito fleet. Locating two water boats, each with a capacity of 100,000 gallons, was a task assigned by the commandant to a Wabash warrant officer.[8]

One manifestation of the urgency of war and the largess of wartime congressional appropriations was a relaxation by the Navy Department of regulations tending to impede work on ships at navy yards. The Boston Steam Engineering Department received orders in mid-April 1898 to purchase "supplies and tools...to outfit vessels for colliers, auxiliary cruisers or harbor defense" before requisitions for those items had been formally approved, "when time can be saved and repairs greatly facilitated." Restraints were also lifted on overtime in connection with several vessels. Respecting work on the gunboat Bancroft, Washington devised a system for circumventing regulations, "if the amount expended for repairs under C. & R. and Equipment exceed the legal limit."[9]

Although the war brought a relaxation of administrative procedures, it also made naval officers in the yard less tolerant of inefficiency and loafing on the part of civilian employees. On three occasions in the spring of 1898, Commandant Howison complained of the behavior of yard workers. During a visit to

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8. Commandant to Lt. Cdr. R. Colby, May 4, 1898; Commandant to Carpenter J. C. Tilden, May 13, 1898, both in 181-5, Box 21; Commandant to Capt. Henry Picking, Apr. 22, 1898, 181-123, Box 6.

9. Bureau of Steam Engineering to Navy Yard, Charlestown, Apr. 16, 1898; Bureau of Steam Engineering to Commandant, Mar. 31, 1898, both in 181-27, Box 6.

the boat shop, he reported hearing "loud conversation and swearing...which loud conversation was not even stopped on my appearance." The commandant ordered the naval constructor to take the "necessary measures to immediately remedy this irregularity" and to inform the "guilty parties" that a repetition would lead to discharge. Later, he observed laborers in the dry dock, placing staging for painting Bancroft. He noted that, as no supervisor was directing the efforts of the men, "many of them were attempting to be `bosses,' ordering, directing and making unnecessary noise and accomplishing little." Howison stated: "I have observed this on other occasions. Perhaps some changes in Leadingmen, Quartermen and Foremen would improve matters." On a third occasion, he saw three Construction and Repair workers "loafing along the walk,...moving very slowly, as if out for pleasure, stopping to watch sailors drill, etc." The commandant remarked that "men must move about their work as if they were on business and accomplish something for their pay." He warned that "workmen found loafing will be immediately discharged."[10]

WAR AND THE CIVILIAN WORK FORCE

Wartime conditions severely tested the procedures at navy yards respecting civilian employees. The great increase in ship work required the rapid hiring of large numbers of laborers, helpers, and mechanics. Introduction of Civil Service regulations earlier in the 1890s ended partisan considerations in employment,

10. Commandant to Head, Depart. of C&R, Mar. 4, 1898; Memorandum for Naval Constructor, Apr. 13, 1898; Commandant to Naval Constructor, Apr. 23, 1898, all in 181-5, Box 21.

but provided for only a superficial pre-hiring check on ability and experience. Virtually any male citizen without a criminal record could have his name added to the registration lists maintained by the Labor Board. Department heads needing additional workers sent labor requisitions to the Labor Board, which instructed the men at the top of the list to report. Upon reporting, those men received temporary wage classifications. New employees had probationary status for two weeks and then were given permanent ratings.

In practice, it also appears that at the end of that probation, decisions were made whether or not the men should be retained. Regulations required department heads to obtain personal knowledge of the workmanship and conduct of probationary workers, but that requirement appears unrealistic in wartime because of the large number of such employees and because of the press of other responsibilities. On-the-job surveillance was provided by master mechanics, quartermen, leadingmen, and others in charge. Grading all employees was important when reductions in force went into effect, since the operating principle was to discharge the less competent and retain the most able. Also the system sought to insure that good workers who had been discharged would be rehired earlier than the less worthy.

Because of several surviving documents for the years 1898 and 1899, the Steam Engineering Department offers an opportunity to examine circumstances created by the war in the area of civilian employees. It will be recalled that in the early years of the 1890s, Steam Engineering employed only a handful of men, thirteen in the spring of 1896. Moreover, the work force did not

include highly specialized mechanics, but helpers and jacks-of-all-trades. A single quarterman machinist supervised the workers in the diverse tasks assigned to them.

Although the Boston Navy Yard hired hundreds of new workers in early 1898, there seems to have been no exhaustion of names on the Labor Board's registration lists for trades required by Steam Engineering or other departments. According to a newspaper account, "when the country was putting on its war paint for the edification of Spain," as many as 150 men could be found at one time in the line leading to the registration desk of the Labor Office in Building No. 5.[11]

A ledger, probably kept by clerks in the office of the Chief Engineer, recorded the labor requisitions submitted to the Labor Board by Steam Engineering and listed the names of men reporting under each requisition. That record shows a remarkable contrast between the prewar and war years. During the month of March 1896, the department had submitted three requisitions for a total of six men. In March 1898, nine requisitions were forwarded, requesting almost fifty workers. Moreover, the requisitions submitted before the war more often than not sought helpers rather than mechanics. In March 1898, on the other hand, the department asked for nineteen machinists and nineteen machinists' helpers (March 18), three boilermakers' helpers (March 18), two blacksmiths (March 22 and 24), one boilermaker (March 27), and four more machinists (March 29). While machinists, blacksmiths, and boilermakers continued to be the trades more frequently

11. Charlestown Enterprise, May 10, 1902, 181-83.

requisitioned, other artisans were required in increasing numbers. Entries appear in the requisition book for two coppersmiths (April 4), two patternmakers (May 6), one rigger (May 7), one pipefitter (May 13), one molder, brass (May 14), and two more patternmakers (May 19).[12] Obviously, Steam Engineering was performing not only much more work, but work of greater variety and requiring higher skills.

Prior to the war, quarterman machinist J. D. Folsom supervised a small force of Steam Engineering workers. In November 1898, the department had 351 mechanics, laborers, and helpers. Three separate work gangs made up the force. Folsom had supervision of 239 laborers and "Miscellaneous mechanics," probably the men working in the department's machine shop in Building No. 42. Leadingman blacksmith Joseph Riley had charge of ninety-one boilermakers, boilermakers' helpers, and holders-on. And leadingman machinist William A. Snedeker supervised twenty-one laborers and mechanics. The want of supervisors was partially alleviated in August 1899, when appointments were made of a master machinist, master boilermaker, and master blacksmith. An enlarged supervisory staff seemed to be required, not only because of the work load, but to weed out incompetent and ineffective workers.[13]

The conclusion seems warranted that the rapid increment in the yard work force resulted in the hiring of some men unqualified or unsuited for the work expected of them. One of the more interesting documents of the war years for the Boston

12. Record of Employees, Department of Steam Engineering, U.S. Naval Yard, Boston, Mass., Sep. 23, 1895-Jan. 1, 1900, 181-116.

13. Chief Engineer to Commandant, Nov. 30, 1898, 181-112.

Navy Yard is "Report of Master Mechanics on Discharged Men," a collection of reports from the chief engineer, assistant engineer, and master mechanics on men recommended for discharge from employment with the Department of Steam Engineering. Poor workmanship was the most common reason given in the recommendations for discharge.

Some excerpts from the collection of reports illustrate the situation:

> John B. Groves, January 23-99. Machinist, discharged Jan. 23. Work poor, conduct excellent. In the opinion of the officer in charge of the Marblehead who had him under observation for two weeks did not think he was fit for shipwork. Sent his name for discharge, as what was needed on the ship was skill and rapidity.
>
> B. B. Meigs. February 9-1899. I gave him the main valves of USS Amphitrite to finish in the planes when they had been false seated which he failed to finish in a workmanlike manner, thereby showing himself incompetent. I at once put a competent workman on the valves with very good results.
>
> J. J. Foley. February 13-1899. I recommend J. J. Foley coppersmith for discharge and rate his conduct good, workmanship Poor. I gave him a 3" bend to turn and make and after 12 hours his bend was in very crude condition and turned in a very unworkmanlike manner.

Perhaps more careful screening in the hiring procedures might have resulted in none of these three men having been employed in the first place.[14]

Some employees lacked the physical ability for shipyard work, as evident in the following instances:

> James Newall. January 19-99. On Amphitrite, in the bilges, refitting and cutting out piping. Man required half time to be on his legs or his back in the bilges. Candidate very old, sickly, and rheumatic. I recommended his discharge, -- in my opinion to save his

14. Reports of Master Mechanics on Discharged Men, 181-120.

life, for which he seemed to be very grateful.

D. Worf. January 19-99. A very old patriarchal man, well past the time when he should perform any hard manual labor. Undoubtedly conscientious and willing to do all he can, but not a very good man to put a board ship under trying conditions of ship in repair in engine and fire room.

Peter T. Clancey. March 29-1899. 2d class Blacksmiths' Helper. I recommend him for discharge as being incompetent. Conduct Excellent, workmanship poor. I gave him a trial with the blacksmith and he was unable to sling the hammer over his shoulder in forging out heavy work.

Generally, recommendations for discharge on the basis of poor workmanship or physical inability were accompanied by conduct gradings of "excellent" or "good." That practice assisted the discharged employee in reregistering with the Labor Board and obtaining work of a different sort in the yard.[15]

"Poor" conduct gradings account for the discharge of a few men during the probationary period. James P. Chute, master machinist afloat, stated that W. E. Dobblin, second-class machinist, was "afraid to dirty his hands" and revealed a "tendency to be lazy and a dislike to do a days work." J. McGraith, messenger, was discharged after reporting three times "under the influence of liquor." J. J. Scanlon, a machinists' helper, was recommended for discharge when, following an afternoon muster, he disappeared and could not be found.[16]

Included in the pages of "Report of Master Mechanics on Discharged Men" are three entries concerning William A. Snedeker, leadingman machinist and, in November 1898, in charge of one of

15. Reports of Master Mechanics on Discharged Men.

16. Reports of Master Mechanics on Discharged Men.

the three groups of Steam Engineering workers. In February 1899, Master Machinist Chute, Chief Engineer John Barton, and Assistant Engineer Allen Cook all recommended Snedeker be reduced to machinist first class. According to those reports, the leadingman lacked "the ability to control a number of men in a way to get good work." Moreover, he displayed a desire to protect incompetent men from observation and consequent discharge." As a supervisor, he did "too much talking in a way that conveys no meaning in explaining a job and then if his work does not come right shifts the blame upon someone else." Because of the unanimity on the part of Snedeker's superiors, it seems likely that he was disrated.[17]

The yard's highest paid civilian caused the most serious complaints about the performance of supervisory personnel. In July 1898, Moses H. Webber, superintendent of the ropewalk, was blasted in a report by Cdr. Allan D. Brown, Equipment Officer. Brown cited numerous examples of Webber's mismanagement and carelessness. In mid-June, the superintendent reported fifty-five days' supply of Manila hemp on hand, when in fact there was enough for only fifteen days, an error of some seventy-five tons. Webber incorrectly informed the Equipment Officer of the speed of the spinning machines and advised him that a large order for wire rope for Norfolk was being filled, when in actuality the seizing machines were not running. Upon being questioned concerning the failure to ship a completed order, Webber stated that he left all shipments to a writer in the office. The superintendent did not

17. Reports of Master Mechanics on Discharged Men.

keep records of daily output of finished material and thus could not determine the efficiency of the operations of the ropewalk or the wire rope mill. Brown concluded that Webber was not willfully negligent, but "his being long accustomed to methods in vogue years ago when the question of cost was not considered, and his age...unfit him for the changed conditions...and the emergency which is now upon us." Brown believed that "a radical change is demanded."[18]

Nothing is known about the personalities of Brown and Webber and little about their backgrounds. Since Brown became an acting midshipman in 1860 and Webber started at the yard in 1871, this was not a case of a young man's intolerance of the ways of someone many years his senior. Probably more important was the military officer's dismay with a casual, business-as-normal approach during a war. Also, as Brown suggests, Webber was part of the "old yard," neither attuned to the needs of the new Navy nor to the ideas of scientific industrial management which were beginning to circulate in America. In September 1899, mechanical and administrative changes occurred at the ropewalk. The shop changed from steam power to electricity, new cordage machinery was installed, and the superintendent replaced.[19]

Special laborers, usually clerical workers, had no immunity against discharge or disciplinary action. At the end of December 1898, Oscar J. Farwell was appointed special laborer and assigned

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18. Equipment Officer to Commandant, Jul. 12, 1898, 181-33, Box 49, vol. 60, p. 158.

19. Callahan, p. 80; ARND, 1900 (FSS #4098), pp. 168-9.

as a clerk in the Department of Steam Engineering. On February 1, 1899, Chief Engineer Barton recommended Farwell be transferred because he was "incapacitated from performing the duties required from his slowness and want of aptitude in handling the routine duties of a special laborer for clerical work...."[20]

Although matters involving civilian employees are better documented for Steam Engineering than for other departments, there is no reason to assume that that department had more than its share of employees who did not meet standards.[21]

The most frequent cause for employees' being discharged was not ineptitude, drunkenness, or laziness, but the "want of work" or "lack of funds." Although the outbreak of war occasioned an enlarged work force, there were slumps, even early in 1898. In March of that year, such a slump struck the ropewalk. Some workers may have been discharged. The Equipment Officer recommended that twenty-four ropewalk employees, all rated as "excellent" in both workmanship and conduct, be furloughed for ten days because of a "lack of funds." In September 1899, the master boilermaker in the Steam Engineering Department proposed six boilermakers be discharged "to reduce the force and on account of their inability to do work required to show a days work...."[22]

Occasionally during 1898 and 1899, it became necessary to

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20. Chief Engineer to Commandant, Feb. 1, 1899, 181-16, Box 10.

21. For a case of an intoxicated fireman on a yard tug, see Captain of Yard to Commandant, Jan. 2, 1898, 181-33, Box 49.

22. Equipment Officer to Commandant, Mar. 6, 1898, 181-3, Box Box 21; Reports of Master Mechanics on Discharged Men, 181-120.

discharge large numbers of workers. This occurred in Steam Engineering in late 1898. Two days before Christmas, twenty-three workers were laid off, and a week later they were joined by 125 more. All of these men had been hired since March 1898, many of them having been among almost two hundred extra men requisitioned in October. That increase arose from the presence in the yard of ten ships. The layoff of 150 men at the end of December resulted from the departure of all but three of those vessels.[23]

In the last two years of the nineteenth century, the procedures for hiring, firing, and promoting civilian workers remained the same. Also, except for teamsters, the wage schedule was not altered. The take-home wages of some workers increased because of longer hours. The yard as a whole did not leave the eight-hour day during the war with Spain, but some departments and shops worked overtime. In July 1898, the Bureau of Steam Engineering issued a regulation concerning overtime and shift work by employees. Generally, when required by the pressure of work, the bureau favored two gangs or shifts, one for the day and one for the hours before midnight. The bureau reasoned that "there is no practical advantage gained by overworking any one set of men." If an emergency arose, but not of such proportion as to require a regular night gang, the day gang could work overtime, but not to exceed a total of ten hours. Normal hours for the day shift were from 7:00 a.m. to noon and 12:30 p.m. to 3:30 p.m. Employees on the night shift worked from 3:30 p.m. to

23. Record of Employees, Department of Steam Engineering, 181-116.

6:30 p.m., and from 7:00 to midnight. In dividing employees into two groups, the bureau held that it was desirable to have more men in the day shift than at nighttime.[24]

During the war, the Navy adhered to regulations governing overtime wages, and employees received the normal rate for work performed before 8:00 p.m. On February 25, 1899, Congress passed a joint resolution providing that employees who had worked in excess of eight hours a day during the period March 18 to October 31, 1898, were to be paid time and a half for their overtime. This resolution applied only to per diem laborers, helpers, and mechanics, that is, those covered by the wage schedules, and not clerks, draftsmen, special laborers, and supervisory mechanics.[25]

IMPROVEMENTS IN THE YARD'S PLANT

As to be expected in a short period, little change occurred in the material plant of the Boston Navy Yard during the years 1898 and 1899. Given the increased usage resulting from wartime activity, some facilities doubtless experienced more rapid deterioration. The war delayed improvements in certain instances, such as installation of additional culverts in the dry dock caisson. Although actual alterations in the yard were few, important decisions were made for substantial yard improvements, especially in the waterfront. Foremost among the projected improvements ranked a congressional appropriation for a second dry dock. Also developments occurred which allowed the extension

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24. Bureau of Steam Engineering to Commandant, Jul. 19, 1898, 181-27, Box 6, vol. for Oct. 1, 1897-Sep. 18, 1898, p. 95.

25. Secretary of Navy, Circular Letter, Mar. 25, 1899, 181-105, Box 3; Resolution No. 17, Feb. 15, 1899, SAL, vol. XXX, p. 1389.

of wharves farther into the harbor. All parts of the yard were ultimately affected by the decision to enlarge the electric generating plant so as to provide power for machine tools as well as more adequate lighting.

The pressures that led to the new dry dock at Boston began when the Navy started building battleships, such as the three Oregon-class vessels authorized in 1890. At that time, only the dock at Mare Island could comfortably accomodate ships of the largest size then being constructed. A few years earlier, the government provided for additional timber docks at Brooklyn, Norfolk, and League Island, but these, like the existing dock at Boston, lacked the width and depth to handle the new warships. As the fleet grew, the problem increased, since ideally steel-hulled vessels needed dry-docking three times a year. Even some of the smaller warships constructed in the 1890s barely fit into the dry dock at the Boston Navy Yard. For example, Amphitrite, commissioned in 1895, posed serious problems when docked in November 1898, because "the size of the vessel so closely meets the limit of capacity of the dock."[26]

In the early 1890s, the civil engineer at the Boston yard advocated the development of a wet basin to be located east of the existing dock and in the only area suitable for a second dock. By 1894, officers at the yard and in Washington favored a new dock over a wet basin. During his brief tour at Boston, Naval Constructor Theodore Wilson, former Chief Constructor of the Navy, recommended "a wooden dry dock of sufficient size to

26. New York Times, Nov. 19, 1890, p. 3; Naval Constructor to Commandant, Nov. 9, 1898, 181-33, Box 49.

take the largest vessel that we now have under construction or may be likely to design in the future...." Wilson argued that costs of such a dock at Boston would be limited, since the yard already had a natural basin and since the pumping plant of the old dock could also be used for the new one.[27] Officers as well as others in the yard in part supported a second dock, since it would clearly aid in the reopening of the yard and reestablishing it as a repair facility. However, the Navy and Congress responded to somewhat larger needs.

Following an investigation by a Navy board and doubtless prompted by the war with Spain, Congress included in its bill of May 4, 1898, authorization for the

> construction of four timber dry docks;...said dry docks to be no less than seven hundred feet in length, and of other dimensions sufficient to meet the present and probable future requirements of the largest vessels in the Navy....

The yards selected for the docks were Portsmouth, Boston, League Island, and Mare Island, each dock not to exceed $825,000 in total costs. Also, the legislation allowed the Secretary of the Navy to build one of the docks of granite or granite-faced masonry and provided an additional $200,000 to cover the greater expense. The Navy appropriation bill of the following year announced the Secretary had selected the Boston yard for the granite dock. A stone dock had definite advantages over timber structures, since the latter suffered from the ravages of toredo, a marine worm, and from other forms of deterioration. Ultimately, it was decided that the three other docks authorized in

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27. Naval Constructor to Commandant, Jul. 10, 1895, 181-16, Box. 9.

1898 should also be constructed of masonry.[28]

The Bureau of Construction and Repair in Washington designed the new docks. Construction of the one at Boston involved two New York firms, working under contract with the Navy. O'Brien & Sheehan had the contract for the dock itself, and Farrell, Hopper & Co. the contract for the pumping plant, generators, and capstans, the two contracts totaling $1,013,400. Excavations by O'Brien and Sheehan began in April 1899. Although Dry Dock No. 2 was not completed until 1906, the decision to build it and the early stages of construction had an immediate impact on the yard.[29]

The new facility was intended to expand the docking capacity of the Boston Navy Yard, not to replace Dry Dock No. 1, sixty-five-years old, but, by 1898, sound and highly serviceable. During fiscal year 1899, small repairs were made to the old dock, including pointing face joints of stairway landings and parts of the outside wall. The dock's caisson was scheduled for repairs, but a combination of circumstances produced delays.

In January 1898, a contract was made with the Atlantic Works of East Boston for placing additional culverts in the caisson to reduce the time required to flood the dock. The contract called upon the yard to lighten the caisson to enable its being towed to the dock of the Atlantic Works. Subsequently, it was decided that increasing the buoyancy to that extent might involve considerable risk. Moreover, beginning in March, repair of ships

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28. Chap. 234, May 4, 1898, SAL, vol. XXX, p. 379; Chap. 421, Mar. 3, 1899, vol. XXX, p. 1035; ARND, 1900, p. 132.

29. AREO, 1899.

at the yard required the presence of the caisson. Not until the winter of 1898-1899 could the Atlantic Works install the culverts, "since so many vessels have been ordered docked, that the repairs to caisson could not be commenced." Rather than towing the caisson to East Boston, the culvert installation was modified and the work performed at the yard. The caisson "had been in use a very long time," and both the civil engineer and the naval constructor recommended construction of a second caisson for Dry Dock No. 1. Instead of proceeding with authorized repairs on the wooden swinging gate, it was decided to delay that work until the recommendation for a new caisson was accepted or rejected.[30]

The remaining component of the existing dry dock was the pumping plant in Building No. 22. In his quarterly report on boilers in the yard, Chief Engineer Barton described the safety valves on all four boilers in the pumping plant as "in poor condition,...old and of very poor design." The valve in Boiler No. 4 blew off constantly as soon as steam rose beyond sixty-two pounds of pressure. Since the pumps required eighty pounds, the attendant in charge had developed the risky habit of tying down the valve. On Barton's recommendation, all of the valves were replaced with new ones of a modern type.[31]

Several developments in the yard's waterfront accompanied the construction of the new dry dock. When completed the 750-

30. AREO, 1899; Commandant to Chief, Bureau of Construction and Repair, Oct. 18, 1898, 181-16, Box 9; Bureau of Construction and Repair to Commandant, Oct. 24, 1898, 181-17, Box 22.

31. Chief Engineer to Commandant, Jan. 19, 1899, 181-112, vol. for Oct. 31, 1898-Dec. 1, 1900, p. 26; AREO, 1899.

foot structure would project beyond the ends of the existing wharves. No harbor line had been established in front of the yard. Acting on a recommendation from the Bureau of Yards and Docks, the War Department laid down a pier and bulkhead line, out to which the yard facilities could extend. Subsequently, the State of Massachusetts and Boston municipal authorities accepted the line and ceded to the United States the land underwater between the old wharf line and the new harbor line. This permitted construction of the new dock, and it also meant that existing wharves could be extended to increase the yard's wharfage capacity. In March 1899, Congress appropriated $150,000 for the extension of old piers and the construction of new ones. The naval constructor, captain of the yard, and civil engineer agreed upon an additional pier to be built west of Wharf No. 4.[32]

To aid in construction of the new dry dock, Wabash changed her berthing place. Previously, she had been moored off the western end of the waterfront. During fiscal 1899, a new berth was dredged at the east end of the yard, and a landing wharf built for the ship. Slips adjacent to Wharves Nos. 4, 5, and 6 were also dredged.[33]

In March 1899, Congress made provision for another change in the waterfront of the Boston Navy Yard. The tract immediately west of the yard was occupied by the Fitchburgh Railroad Company. Congress permitted the company to enlarge its slip, "partly upon the land of the navy-yard and partly upon lands" belonging to the

32. ARND, 1898, p. 219; AREO, 1899.

33. ARND, 1899, p. 157.

railroad. The completed slip would be 160 feet in width and 570 in length. Both the Navy and the Fitchburgh company would have use of the slip to berth ships at their respective piers, but the company would pay the cost of dredging and of construction of retaining walls. The Navy received authority to suspend use by the railroad in the event of war or other emergency.[34]

Events of 1898 and 1899 provided the Boston Navy yard with a significantly altered waterfront, consisting of a new slip and dry dock and expanded wharfage. One other major change was instituted during the period of the Spanish-American War. Barely five years old, the yard's electric lighting plant proved inadequate. The system provided poor illumination in some parts of the yard and was deemed incapable of meeting anticipated needs for electrical power. A complaint of Chief Engineer Barton reveals weaknesses in the lighting service. In December 1898, Barton stated that "at this time of year and with the present cloudy weather, the work in the machine shop is very seriously impaired for want of lighting facilities" and that "we are now using candles and oil lamps with tools of precision and not with satisfactory results." The chief engineer also noted the need for proper lighting in the passageway to the main street, "which is now in utter darkness after nightfall and dangerous to those who remain in the building after dark."[35]

In fiscal year 1899, electric lights were fitted in

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34. Chap. 421, Mar. 3, 1899, SAL, vol. XXX, p. 1039. See also Commandant to Fitchburgh R.R. Co., Feb. 24, 1898, 181-3, Box 21.

35. Chief Engineer to Commandant, Dec. 13, 1898, 181-33, Box 49, vol. 30, p. 287.

buildings not included in the original system, and eighteen other buildings were wired for additional lights. Lighting was also extended to four vessels in the yard, Marcellus, Vicksburg, Minnesota, and Hector. Even greater demands for electricity would arise in the near future because of the use of electrical power in several new projects. This included the pumping plant of the new dry dock, a forty-ton traveling crane, three pillar cranes, four elevators in Building No. 42, and two elevators each in Buildings Nos. 36 and 39.[36]

Clearly, the yard needed a large, permanent power plant. However, a short-run solution was instituted in the form of an additional electric lighting station housed in a temporary structure, located on the site of Building No. 44, which was moved out of the way. Slow progress by the contractors delayed completion of the new plant. In 1900, the yard switched over to the new station, although the Navy had not yet accepted the system from the hands of the contractor.[37]

The Spanish-American War stimulated the Navy and Congress to make improvements in the nation's navy yards, but most of the plant additions came after the end of hostilities, and the Boston yard carried out its wartime assignments using facilities already in existence.

THE YARD'S WAR WORK

As measured in terms of work on ships, the war with Spain began for the Boston Navy Yard in late March 1898 and lasted

36. AREO, 1899.

37. AREO, 1899 and 1900.

until August 1899. During the first several months of 1898, the yard had under repair only the receiving ship Wabash and the decommissioned Lancaster. The first vessel arriving in the yard to be readied for the war very clearly in the making was Machias, a gunboat originally commissioned in 1893 and recently on duty in the Far East. Departing Hong Kong in mid-December 1897, she arrived in the yard on March 18. Several days earlier, the yard received a telegram from Washington directing her repair with "utmost dispatch." A letter from the same source gave instructions to perform all necessary repairs that could be completed within two weeks. The yard finished its work on April 2, and, after receiving ammunition, Machias sailed on April 7 for Key West and Cuba, where she participated in the blockade and saw action at Cardenas.[38]

Before the departure of Machias, three other warships arrived at the yard, the gunboat Bancroft, and two Civil War monitors, Catskill and Leheigh. Bancroft, returning home after eighteen months in the eastern Mediterranean, was also to be repaired with "utmost dispatch." Authority was granted for "working overtime as necessary," for waiving "ordinary regulations governing purchase of material," and for exceeding cost limitations. On April 5, the day after coming to the yard, Bancroft entered dry dock for a two-week stay. Steam Engineering repairs included truing up crosshead pins and fitting new brasses, overhauling water service piping, overhauling four

38. DANFS, vol. IV, p. 180; Bureau of Steam Engineering to Commandant, Mar. 18, 1898, 181-27, Box 6; Commandant to Sampson, Apr. 2, 1898, 181-3, Box 21.

TABLE No. 2: DRY-DOCKINGS, BOSTON NAVY YARD, 1898 AND 1899

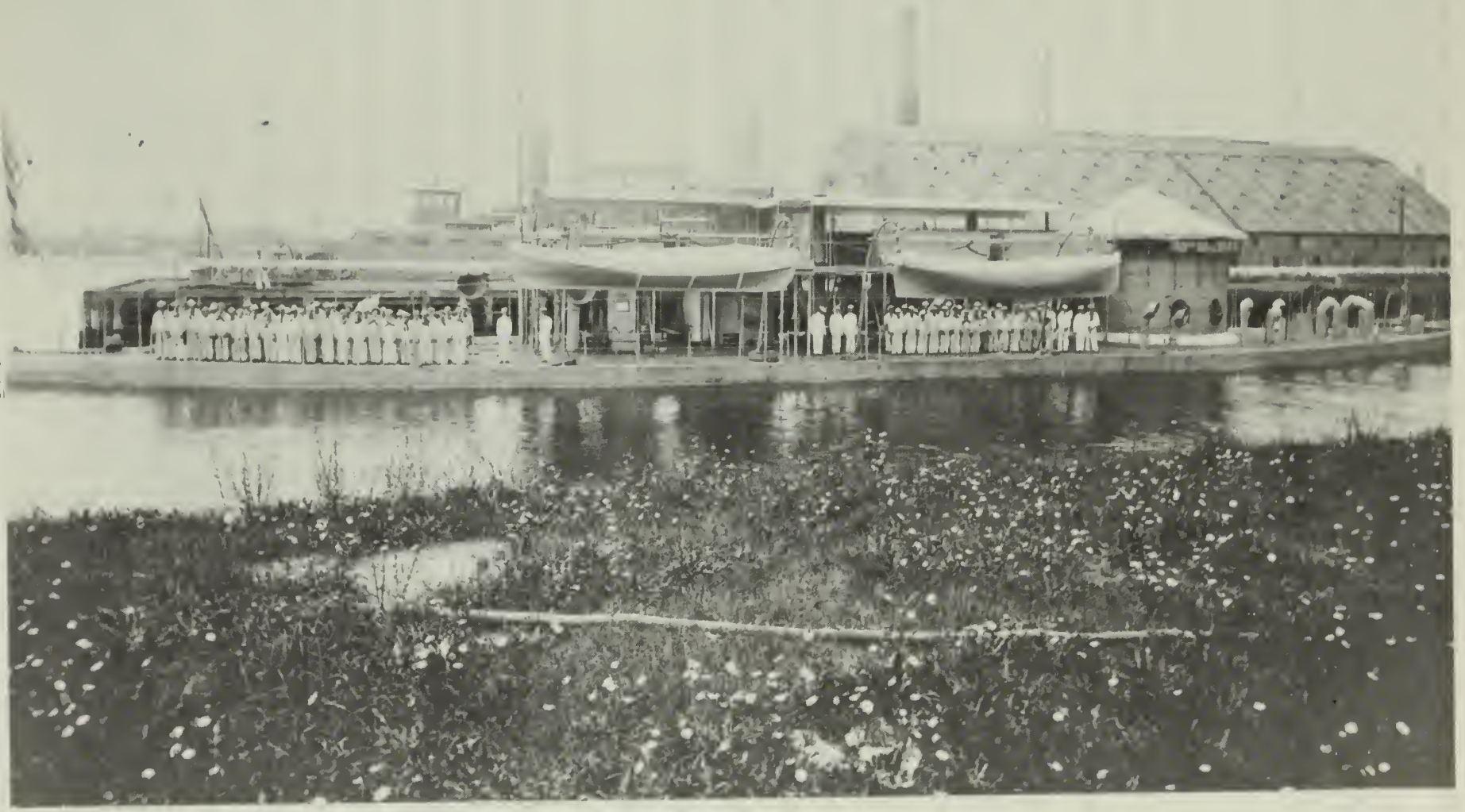
	In	Out	Name of Vessel	Type
1898	Apr 4	Apr 19	Bancroft	gunboat
	Apr 21	Apr 25	Enterprise	screw sloop
	Apr 21		Illawara	yacht
	Apr 30	May 11	Lebanon	collier
	May 13	May 26	Southery	collier
	Jun 1	Jun 13	Vulcan	repair ship
	Jun 16	Jun 25	Lehigh	monitor
	Jun 21		Inca	yacht (docked on marine railway, Atlantic Works)
	Jun 28	Jul 21	Wyandotte	monitor
	Jul 23	Aug 15	Marcellus	collier
	Aug 18	Sep 10	Hector	collier
	Sep 14	Sep 24	Helena	gunboat
	Sep 26	Oct 3	Wilmington	gunboat
	Oct 4	Oct 14	Castine	gunboat
	Oct 17	Nov 8	Detroit	cruiser
	Nov 18	Dec 28	Amphitrite	monitor
	Dec 31	Jan 13	Marblehead	cruiser
1899	Jan 13	Jan 17	Iwana	tug
	Mar 14	Mar 23	Minia	cable steamer
	Mar 27	Apr 8	Bancroft	gunboat
	Apr 13	May 20	Enterprise	screw sloop
	May 24	Jun 14	Vesuvius	gunboat
	Jun 24	Jun 30	Lancaster	screw sloop
	Jul 6	Jul 20	Osceola	tug
	Jul 24	Aug 3	Vicksburg	gunboat
	Aug 9	Aug 22	Dolphin	dispatch boat
	Aug 23	Sep 15	Marietta	gunboat
	Sep 19	Sep 26	John Prescott	schooner (privately owned)
	Sep 27	Oct 4	Peoria	converted gunboat
	Sep 27	Oct 4	Seminole	tug
	Oct 16	Oct 13	Bancroft	gunboat
	Oct 19	Oct 24	Machias	gunboat
	Oct 25	Dec 6	Chesapeake	training bark
	Dec 8	Sec 21	Alliance	screw gunboat
	Dec 22	Jan 3	Iwana	tug
	Dec 22	Jan 3	Water Barge No. 5	

(SOURCE: Docking Log, 181-60. Except for the docking of Inca on Jun. 21, 1898, the Docking Log does not list dockings at commercial yards of ships under repair by the Boston Navy Yard.)

auxiliary pumps and fitting them with new seats and studs, and patching the two boilers and plugging their bottom stay tubes. Construction and Repair worked on the hull, pilothouse, and gun mounts; provided new furniture; and replaced cellulose in some bulkheads. Equipment workers furnished complete outfits of rigging, canvas, galley and cooking utensils, boat supplies, anchors and chains, cordage, electrical supplies, and instruments and appliances of navigation. In mid-May, Bancroft joined the North Atlantic Squadron and subsequently convoyed troops to Cuba and served in the blockade off Havana.[39]

As work was ending on Machias and beginning on Bancroft, two monitors, Catskill and Lehigh, entered the yard under tow from Philadelphia, where they had been out of commission at League Island. A third monitor at Boston in the spring of 1898 was Wyandotte, launched in the Civil War but not completed until 1867. Since 1896, Wyandotte had been in the use of the Connecticut naval militia and stationed at New Haven. Like the other monitors, Wyandotte was towed to Boston. The yard prepared the three vintage vessels for use in defense of Boston Harbor and overhauled their guns and carriages, put machinery in working order, and outfitted them with the necessary equipment. Washington once more ordered "utmost dispatch" in the repairs of Catskill and Lehigh. Catskill was recommissioned on April 16, Lehigh two days later, and Wyandotte on April 30. However, at least Lehigh and Wyandotte required further work. All three

39. DANFS, vol. I, p. 90; Bureau of Steam Engineering to Commandant, Mar. 31, 1898, 181-27, Box 6; List of Letters Received from Bureau of Construction and Repair, Apr. 18 and Apr. 25, 1898, 181-16, Box 9.



PHOTOGRAPH NO. 2: USS Wyandotte at the Boston Navy Yard in 1898, with her crew paraded on deck.

monitors remained in Boston Harbor, sometimes undergoing repairs at the navy yard. Lehigh was dry-docked for nine days in June and Wyandotte for twenty-three days in June and July. In September 1898, the three were sent to League Island, decommissioned, and sold a few years later.[40]

The nation needed navy colliers more than thirty-five-year-old monitors. The early prosecution of the war revealed a serious weakness in the Navy's fuel arrangements. Navy yards lacked coaling facilities, and the fleet lacked colliers, reliance in peacetime having been placed on contracts with private coal firms. Rapid acquisition of commercial vessels by purchase from their private owners proved a speedy, if somewhat makeshift, expedient. During the war, the Boston Navy Yard worked on four of the Navy's newly acquired colliers, Lebanon, Southery, Marcellus, and Hector. The Navy purchased the first three and seized the fourth, a Spanish steamer, as a prize of war.

The colliers were among the largest ships in the yard during the Spanish-American War, Marcellus, being almost three hundred feet long with a displacement of 4315 tons. The conversion of private ships presented the yard with special problems, since the Navy did not have on file plans of hull, machinery, or general layout. When possible, the Navy sought to obtain such plans from the ships' owners or builders. To hinder enemy identification of

40. DANFS, vol. II, p. 56; vol. IV, p. 83; vol. VIII, pp. 488-9; Bureau of Steam Engineering to Commandant, Mar. 24, 1898 and May 9, 1898, both in 181-33, Box 49; C. R. Reolher and John Hoover to Secretary of Navy, Apr. 4, 1898; Bureau of Construction and Repair to Commandant, Apr 22, 1898, both in 181-17, Box 22.

the colliers as military vessels, the Navy ordered that no alterations be made in the "grand appearance" of the ships, that their hulls be painted black, and that their names be unchanged. The Bureau of Equipment sought to have colliers perform double duty, carrying coal and also water. The bureau directed that their double bottoms be so fitted that they could transport fresh water for distribution to torpedo boats and other small craft having no water storage capability. The Navy Department became slightly outraged with the yard's seemingly slow progress on the colliers. At the end of April, the commandant received a telegram stating the urgent need for the ships and asking for a detailed explanation of the delay in the completion of Lebanon.[41]

Lebanon, constructed by Cramp & Sons of Philadelphia in 1894, was purchased from the Philadelphia and Reading Coal and Iron Company. Through its agent in Boston, the company furnished the navy yard with a set of specifications for the hull and machinery and also four blueprints of the vessel. On behalf of the Navy, Commandant Howison accepted Lebanon on April 7, and she was commissioned April 16. Southery, purchased on April 7, was an English-built steamer, constructed in 1889. She was received at the Boston Navy Yard and commissioned early in May. Lebanon and Southery were both dry-docked in May and underwent repairs by Construction and Repair and Steam Engineering workers. The Department of Equipment furnished outfits for collier duty. After a brief shakedown cruise, Lebanon steamed out of the yard on May 17 with coal for ships off Cuba, arriving at Cardenas on

41. Bureau of Construction and Repair to Commandant, Apr. 29, 1898, May 16, 1898, and Aug. 9, 1898, all in 181-17, Box 52.

June 4. She operated in the Caribbean and off the Atlantic Coast during the following ten months. The yard finished work on Southery by June 6, when she cleared Boston Harbor to deliver fuel along the East Coast. In early July, Southery entered Norfolk Navy Yard for machinery repairs and then resumed her duties until February 1899.[42]

The Navy purchased Marcellus in mid-June 1898, and work on her started on July 1. Formerly Titania and built in England in 1879, she presented the navy yard with a small problem. In examining her contents, Naval Constructor Feaster found thirty-seven cases of bottles containing an unknown liquor. As ordered by the commandant, Feaster delivered the goods to the Medical Department. Medical Inspector John L. Neilson, in a manner not made clear, identified the contents as gin and advised the commandant that he had the thirty-seven cases "now in store." Following docking, repairs, outfitting, and commissioning, Marcellus left the yard and cruised along the East Coast until early 1899, when she departed with coal and supplies for American forces at Havana.[43]

The last of the colliers under repair by the Boston Navy Yard during the conflict with Spain was Hector. Built in 1883, formerly named Pedro by her Spanish owners, and seized as a

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42. DANFS, vol. IV, p. 79; vol. VI, p. 569; Commandant, Receipt; Commandant to Collector of Customs, Apr. 20, 1898, both in 181-3, Box 21; Bureau of Steam Engineering to Commandant, Apr. 15, 1898 and Apr. 22, 1898, both in 181-27, Box 6.

43. DANFS, vol. IV., pp. 231-2; Bureau of Steam Engineering to Commandant, Jul. 1, 1898 and Aug. 19, 1898, both in 181-27, Box 6; Medical Inspector to Commandant, Jul. 8, 1898, 181-33, Box 49.

prize, she entered commission in the American Navy in June 1898. After duty in waters off both coasts of Florida, Hector steamed north, entering the Boston Navy Yard for repairs on July 31. The yard had already been directed "to put her in proper order for use as a collier." The Steam Engineering Department undertook repairs on the auxiliary pump and distilling apparatus, Construction and Repair docked her, and Equipment outfitted her with canvas, cordage, electrical items, chains, and anchors. However, because of the end of the fighting in Cuba, the Navy suspended work on Hector on August 31. In the following months, the ship was taken out of commission and placed in ordinary, the first of the vessels acquired or activated during the war to be decommissioned at Boston.[44]

The Boston Navy Yard converted other civilian vessels during the war against Spain. Commandant Howison represented the Navy in the purchase of two ferryboats belonging to the city of Boston. Under the supervision of the yard's naval constructor, both were converted into gunboats at private shipworks in the area. The Navy purchased East Boston, built in 1892, for $50,000, and the vessel was outfitted at the Lockwood Manufacturing Company, which billed the Navy for almost $40,000. It was the original intention to assign the vessel to duty off Cuba. Purchased in mid-May, commissioned in early July, the ship remained in Boston Harbor until September 3, 1898, when she was

44. DANFS, vol. III, p. 284; Bureau of Steam Engineering to Commandant, Jul. 27, 1898, 181-27, Box 6; Commandant to Commodore Brown, Aug. 13, 1898, 181-105, Box 3; Bureau of Construction and Repair to Commandant, Aug. 9, 1898, 181-17, Box 22.

decommissioned.[45]

Governor Russell, the other Boston ferryboat, had been launched shortly before being acquired by the Navy at a cost of $76,000. Conversion work included making the starboard passenger cabin into officers' staterooms; fitting the port cabin for the ship's crew; installing smaller cabin windows; building magazines and storerooms; reducing the size of the firerooms; adding coal bunkers; providing scuttles and coal chutes; and closing all air ports in the hull. Governor Russell was commissioned on June 24 and left on July 16 for Port Royal, South Carolina. Storms delayed her arrival until August 7. She then underwent extensive repairs in dry dock. While sailing for New York with a cargo of ammunition, she encountered a second severe storm and put in at Hampton Roads. There she was declared unfit for further naval service.[46]

In the spring of 1898, the Boston Navy Yard fitted out three non-naval vessels for service in the auxiliary coast defense fleet. Oneida, the former Illawara, was a yacht delivered to the yard on April 21 and commissioned April 30. Preparations by the yard included dry-docking and the installation of a battery of four one-pounder guns. The newly constructed Inca was

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45. DANFS, vol. II, pp. 318-9; Secretary of Navy to Commandant, May 7, 1898 and Commandant to Commodore Watson, May 14, 1898, both in 181-105, Box 3; Commandant to Pay Director, May 10, 1898, 181-3, Box 21; Bureau of Construction and Repair to Commandant, May 10, 1898 and Sep. 28, 1898, both in 181-17, Box 22; Bureau of Steam Engineering to Commandant, Jul. 16, 1898, 181-27, Box 6.

46. DANFS, vol. III. p. 126; Chief Engineer to Commandant, Jun. 30, 1898, 181-112; Naval Constructor to Commandant, May 16, 1898, 181-16, Box 9.

commissioned on June 15, docked at the Atlantic Works on June 16, decommissioned on August 27, and turned over to the Massachusetts naval militia. Prior to the war, Calumet, a harbor cutter, was in the service of the Coast Guard. After her acquisition by the Navy, the ship was docked, cleaned, and painted at the Atlantic Works.[47]

To serve its enlarged fleet, the Navy procured additional tugs, one of which was outfitted under the supervision of the Boston yard. The Navy bought Kate Jones from the Boston Towboat Company. The Lockwood company did the work on the vessel, renamed Seminole. During her steam trial, the circulating pump blew out, resulting in "the total destruction of pump and engine." With a new engine and pump, Seminole was commissioned on July 23, 1898, and she remained at the Boston yard as a yard tug until March 1900.[48]

In converting the steamship Chatham into Vulcan, the Boston Navy Yard participated in a valuable innovation, the Navy's first repair ship. Purchased in Baltimore on May 2 for $350,000, the ship was sent to the Boston yard, where Steam Engineering repaired her and fitted her with machine tool, forges, foundries,

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47. DANFS, vol. V, p. 155; vol. III, pp. 422-3; vol. II, p. 17; Bureau of Construction and Repair to Commandant, Apr. 26, 1898, 181-17, Box 22; Bureau of Steam Engineering to Commandant, Apr. 27, 1898, 181-27, Box 6; Board on Auxiliary Vessels to Commandant, Apr. 26, 1898, 181-123, Box 6; Bureau of Steam Engineering to Commandant, Jun. 6, 1898, 181-27, Box 6; Bureau of Construction and Repair to Commandant, Jun. 2, 1898, 181-17, Box 33; Bureau of Steam Engineering to Commandant, Jun. 2, 1898, 181-27, Box 6.

48. DANFS, vol. VI, p. 436; Bureau of Steam Engineering to Commandant, Jun. 6, 1898, 181-27, Box 6; Bureau of Construction and Repair to Commandant, Jun. 14, 1898, 181-17, Box 22.

and a large assortment of stores. Construction and Repair docked Vulcan on June 1 and, among other work, mounted a battery of six-pounders. The ship left the yard in mid-June and served in the Caribbean throughout the war, repairing sixty-three ships and engaging in the salvage of damaged Spanish vessels.[49]

During the first months of the war, the Boston Navy Yard repaired, converted, and outfitted vessels newly obtained by the Navy. It also worked on vessels already belonging to the service. In addition to the three monitors and Bancroft and Machias, it repaired two other ships of war. The largest vessel in the yard during the conflict with Spain was the 413-foot cruiser Columbia, on patrol off the Atlantic coast and in the West Indies. She entered the yard briefly in early May to have her bow plates reinforced. Katadhin, the armored ram, patrolled the coast from New England to Norfolk. She came to the yard for repair of machinery. Lancaster, the pre-Civil War steam sloop, had been in decommissioned status at the outbreak of the war, having spent the winter in the Boston yard's dry dock. The war required her services, and she was prepared by the yard as a station ship for Key West. A security violation occurred in connection with Lancaster, since the Boston Globe ran an article describing the ship's assignment and quoting at length from Commandant Howison's orders to department heads respecting the vessel. Lancaster sailed on May 5 and remained at Key West during

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49. DANFS, vol. III, p. 565; Bureau of Steam Engineering to Commandant, May 4, 1898, 181-17, Box 22; Assistant Secretary of Navy to Commandant, Apr. 24, 1898, 181-105, Box 3.

the rest of the war.[50]

Most of the Boston Navy Yard's activities between March and August 1898 involved preparing ships for service in the war. A slump occurred in August, followed by a resumpton of activity in September. By that time, most repairs were to ships returning from duty in the Caribbean. Some of these vessels were being made ready to continue service either in the West Indies or in the Far East. Others entered decommissioned status, as the Navy scaled down after the fighting ceased. In September, the yard worked on two cruisers, Badger and Detroit, and six gunboats, Bancroft, Castine, Helena, Marietta, Vesuvius, and Wilmington. Three other warships came to the yard before the end of the war, the monitor Amphitrite and the cruisers Olympia and Marblehead.

Among the vessels returning from the war and undergoing repairs before resuming war-related service was the gunboat Marietta. That vessel had achieved some fame in the spring of 1898, when she accompanied Oregon on her voyage from the West Coast, around the tip of South America, and thence to waters off Cuba. After participating in the blockade of Havana, Marietta arrived at the Boston Navy Yard on September 2 for a month-long stay. Work on her included docking, painting, engine repairs, and extensive repairs and alterations on canvas and rigging

50. DANFS, vol. II, p. 147; vol. III, pp. 602-3; vol. IV, pp. 40-2; Commandant to Bureau of Construction and Repair, May 9, 1898, 181-74, Box 9; Bureau of Steam Engineering to Commandant, May 5, 1898 and May 7, 1898, both in 181-27, Box 6; Memorandum for Heads of Departments, May 8, 1898, 181-33, Box 49.

outfits.[51] The ship then returned to the Caribbean.

Machias, which had been in the yard in March, returned in September following duty in the West Indies. Machias required extensive repairs, some of which were performed at Boston and others at Portsmouth. In January 1899, the gunboat sailed to the Caribbean. Both Machias and Marietta returned to Boston for docking in the second half of 1899. Wilmington spent the period from September 9 to October 25, 1898, at the Boston Navy Yard. The ship underwent repairs by the Departments of Construction and Repair, Steam Engineering, and Equipment to prepare her for a three-year cruise on a foreign station. From Boston, Wilmington sailed to Norfolk for further repairs and then to South America.[52]

The yard received orders to give priority to work on Wilmington and also Helena and Castine, two other gunboats. Prior to coming into the yard, Helena had seen action off Cuba. The Navy Department authorized overtime and an increase in the work force to expedite repairs of the vessel. From Boston, Helena sailed, by way of Suez, to her new assignment in the Philippines, where she took part in the suppression of the

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51. DANFS, vol. IV, pp. 238-9; Bureau of Construction and Repair to Commandant, Aug. 30, 1898, 181-17, Box 22, vol. for Aug. 1, 1898-Nov.14, 1898, p. 24; Bureau of Steam Engineering to Commandant, Sep. 20 and Sep. 27, 1898, both in 181-27, Box 7.

52. DANFS, vol. VIII, p. 387; Bureau of Construction and Repair to Commandant, Sep. 14, 1898, 181-17, Box 22; Bureau of Steam Engineering to Commandant, Sep. 20, 1898, 181-27, Box 7; Bureau of Construction and Repair to Commandant, Aug. 10, 1898, 181-17, Box 22; Commandant to Commander Green, Sep. 1, 1898, 181-105, Box 3.

Filipino Insurrection. Also destined for the Philippines was Castine. Like other gunboats in the yard in the fall of 1898, Castine had been in the West Indies. Repairs on her took longer than the thirty days the Navy had originally allowed, and the ship sailed in late December. When Amphitrite, a monitor built in 1895, came to the yard in October 1898, the Navy ordered quick repairs to enable her to return to service as a gunnery training ship.[53]

Four cruisers were in the yard during the last third of 1898. Badger had been constructed as a steamer by Roach and Sons in 1889. The Navy purchased her, and the New York Navy Yard converted her into an auxiliary cruiser at the beginning of the war. After serving in Cuban waters, the ship carried troops to New York in August and arrived in the Boston yard in the last week of the month. Repairs to Badger included replacing wardroom water closets. In December, the ship left the East Coast for San Francisco. The cruiser Detroit remained in the yard from September to December 1898, undergoing general repairs, especially by Steam Engineering. The ship entered dry dock on October 17 and was undocked November 8. Equipment workers made extensive repairs and changes in electrical appliances and in canvas and rigging outfits. Detroit returned to the Caribbean in

53. DANFS, vol. III, p. 287; Bureau of Construction and Repair to Commandant, Sep. 1, 1898, 181-17, Box 22; Bureau of Steam Engineering to Commandant, Sep. 19, 1898 and Oct. 6, 1898, both in 181-27, Box 7; Bureau of Construction and Repair to Commandant, Sep. 21, 1898, 181-17, Box 22; DAFS, vol. II, p. 50; Navy Department to Commandant, Oct. 28, 1898, 181-27, Box 7.

February 1899.[54]

After considerable action in Cuba, Marblehead reentered the Boston Navy Yard on November 2, 1898. Repairs lasted until early February and included replacing propeller blades; renewing, remaking, or overhauling steam pipe joints, air pump valve seats, and the air chamber in the starboard feed pump; and docking and painting. On February 9, 1899, Marblehead departed the yard and cruised briefly in the Caribbean before joining the Pacific Squadron. The fourth cruiser in the yard at the end of 1898 was Olympia, Commodore George Dewey's flagship in the Battle of Manila Bay. She went out of commission in October and remained at the yard until 1902, undergoing extensive repairs. The assignment of Olympia to Boston indicates the Navy recognized that the yard had regained its status as a repair facility, capable of work on major warships.

In addition to Olympia, other vessels were decommissioned at the Boston Navy Yard in the aftermath of the Spanish-American War. Following her repairs at the yard, the gunboat Bancroft served in Cuba. She then returned to Boston and was placed out of commission on September 2, 1898. Subsequently, extensive repairs were performed. Among the work was the removal of the entire torpedo plant and the permanent sealing of the torpedo ports. Although Bancroft was ready to reenter service in late May 1899, her officers and crew had not yet assembled, and she was not

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54. DANFS, vol. I, p. 82; Commandant to Bureau of Construction and Repair, Sep. 5, 1898, 181-16, Box 9; ARND, 1899, p. 604; DAFS, vol. II, p. 49. Bureau of Steam Engineering to Commandant, Aug. 31, 1898, 181-27, Box 6; Bureau of Steam Engineering to Commandant, Oct. 29, 1898, 181-27, Box 7.

recommissioned until August 1899.[55]

Also decommissioned in September 1898 was the dynamite-gunboat Vesuvius. Another veteran of the conflict in Cuba, Vesuvius remained out of commission at the Boston Navy Yard until 1905. Work on her at the yard in the immediate postwar years consisted of repairs necessary to keep her in a proper state of preservation. Topeka, a steamer converted into a gunboat, went out of commission in February 1899, after cruising between Key West and Cuba during the war. Following decommissioning, she underwent an overhaul and remained in ordinary until August 1900. Two of the colliers acquired during the war by the Navy were among the decommissioned vessels at the Boston Navy Yard. Sterling was taken out of service in March 1899, and little work was done on her. Hector had been decommissioned in September of the previous year and was sold in October 1899. The last ship to serve in the war and go out of commission at Boston was Vicksburg, a gunboat. She entered the yard in May 1899 and remained out of service until May 1900.[56]

Although a small war, the struggle with Spain produced a number of conditions and developments at the Boston Navy Yard which would reappear during subsequent and greater struggles, namely World Wars I and II. Of course, these included an expanded labor force, more yard officers, and a vastly increased volume of work. Wars created demands exceeding the capacity of the yard, and some ship work was contracted out to commercial

55. DANFS, vol. I, p. 90; ARND, 1899, p. 607.

56. DANFS, vol. VII, pp. 235, 455; ARND, 1899, p. 608.

repair firms in the area, working under the supervision of yard officers. War work generally involved the conversion to military use of non-naval craft. As in the Spanish-American War, subsequent wars saw a relaxation of administrative red tape and the cutting of bureaucratic corners to get the job done as soon as possible. Also, later international conflicts would see a reappearance of an impatience on the part of yard officers with civilian workers who loafed on the job.

Chapter III

THE EARLY TWENTIETH CENTURY, 1900-1914

During the years from 1900 to 1914, a program of capital ship construction advanced the United States Navy to the position of third largest in the world. The general thrust of congressional legislation was to produce a navy second only to that of Great Britain. That goal required the laying down of two new capital ships each year. Adherence to the building program would provide forty-eight capital ships by 1920. Emphasis on battleships promised a top-heavy fleet, but the administrations of Presidents Theodore Roosevelt and William Howard Taft held that it took four years to construct battleships and that smaller vessels could be built in much less time as required by circumstances.

A design revolution occurred in 1906, when the British launched the secretly constructed HMS Dreadnought, the archetype of all subsequently designed battleships. Dreadnought's armament consisted entirely of big guns, ten 12-inch rifles in five turrets, instead of the mixture of calibers found in existing battleships. As protection against torpedo boats, the latest British vessel had twenty rapid-fire 12-pounders. With her turbine engines, speed of 21.5 knots, eleven inches of armor, length of 490 feet and breadth of eighty-two, Dreadnought reduced all previously constructed battleships to inferior status and encouraged other navies to seek even larger ships.

Expansion of the American battle fleet required increased

activities at the nation's navy yards and brought about the revival of the yard at Boston. The completion of a new dry dock permitted that yard to undertake the repair of battleships. However, ships built after Utah and Florida, launched in 1909 and 1910, exceeded the capacity of the second dock, and the yard's battleship repairs were restricted to vessels built during the first decade of the twentieth century. Because of that situation, Boston became the regular repair yard for the five Virginia-class ships, Rhode Island, New Jersey, Georgia, Virginia, and Nebraska.

Other developments in ship design provided work for the Boston Navy Yard. The United States did not build battle cruisers, a second British innovation and intended as cruiser-killers. It did adopt two other types of warships. Destroyers evolved in the 1890s to counter the appearance of torpedo boats. America's first torpedo boat destroyers were launched in 1900. Even after torpedo boats themselves became less common, destroyers continued to increase in number because of their high utility and low cost. By 1914, the United States had sixty-two destroyers built or building, and a division of these vessels, along with the five battleships, constituted an important part of the repair load of the Boston Navy Yard. The yard also worked on another new boat, submarines. An American innovation and developed as early as 1875, submarines nevertheless remained experimental craft in the Navy during the first fifteen years of the twentieth century. Most of the work of the Boston yard on submarines was placing them in commission.

The conclusion of the war with Spain did not see a return of

PHOTOGRAPH NO. 3: Post card photograph of the waterfront of the Boston Navy Yard, with several battleships at dock. Circa 1905.

the Boston Navy Yard to its previous, nineteenth-century tempo or volume of activity. Early in 1901, the headline of a local newspaper announced "IT IS AN OPEN YARD." That journal gave credit for the reinvigoration of the facility to the wisdom and ability of certain individuals, particularly John D. Long, Secretary of the Navy from 1897 to 1902 and himself from Massachusetts, and Naval Constructor William J. Baxter, the head of the yard's Department of Construction and Repair in the early years of the new century.[1] However, the general growth of the Navy played a greater role in the changing fortune of the Boston Navy Yard.

YARD ADMINISTRATION IN AN ERA OF REFORM

The years 1900 to 1914 have significance in the history of the Boston Navy yard because of several substantial reforms introduced by the Navy into the administration of all of its yards. Those changes occurred primarily between 1908 and 1913. During most of the first decade of the twentieth century, the organizational structure of the Boston yard remained the same as in the 1890s, except for an increase in the number of yard officers and several minor alterations involving off-yard personnel and installations. In 1901, the Navy started to send young officers in the Construction Corps to a three-year course in naval architecture at the Massachusetts Institute of Technology, located in Cambridge and not far from the Boston Navy Yard. While pursuing the course of study, these officers were

1. Article in unknown Charlestown newspaper, Mar. 3, 1901, 181-83.

formally a part of the Boston Navy Yard, adding somewhat to the administrative chores of that yard, which had responsibility for keeping their personnel records and handling such matters as leave. During the summer, the students went on duty at the several navy yards, including that at Boston, to obtain practical experience.[2]

The yard commandant and the ordnance officer were involved in the Navy's purchase of property at Hingham, Massachusetts, and the subsequent development there of a naval ammunition depot. Naval personnel and civilian employees at the new installation came under the administrative supervision of the yard.[3]

Of slight immediate concern, but of importance for the future, was the establishment in 1903 of a system of naval districts. Prior to 1915, this system had little meaning for the Boston Navy Yard. The 1903 orders creating naval districts had their origins in the early stage of the Spanish-American War, when exaggerated fears of an assault by an enemy squadron produced panic in the seaports of the Atlantic and Gulf Coasts. The Navy responded by organizing auxiliary defense units and the mosquito fleet for the purpose of harbor defense. In the administration of that defense, the nation's coasts were divided into nine districts. The mosquito fleet and the districts disappeared with the end of the war, but the desirability of a

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2. History of the Construction Corps, p. 41. For example of correspondence dealing with officers at MIT, see Commandant to Chief, Bureau of Navigation, Feb. 2, 1907, 181-20, Box 7.

3. Department of Justice to Ordnance Officer, May 14, 1906, 181-22, Box 6; Inspector of Ordnance to Bureau of Ordnance, Aug. 24, 1909, 181-101, Box 4, #2600.

permanent system of coast defense remained.[4]

In 1902, the Secretary of the Navy implemented an experimental system of three districts. On the basis of that experiment and in accord with the recommendations of the General Board, he created in May 1903 thirteen naval districts, each headed, when possible, by the commandant of a navy yard within the district. Boston fell into the First Naval District, whose commandant was the commandant of the Portsmouth Navy Yard. Detailed instructions for the implementation of the 1903 order did not appear until 1907. Generally, the naval district system from 1903 to 1914 was designed for employment only in the event of actual hostilities, and the 1907 directive was in the nature of stand-by orders. The district system began to take on significance with the outbreak of the war in Europe in August 1914. In the following year, the commandant of the Boston Navy Yard became the commandant of the First Naval District.

The administration of the Boston Navy Yard, 1900-1914, appears in no way to have been affected by introduction of the district system. Until a period of shop consolidation and yard reorganization between 1908 and 1913, the yard continued to consist of commandant, captain of the yard, and departments representing the various bureaus in Washington. Retention of the bureau system perpetuated the decentralization characteristic of nineteenth-century navy yards. Many within and outside of the Navy believed the yards needed to be reformed because of the

4. Fifty Years of Naval District Development (Washington: Naval History Division, 1956), pp. 3-4; Furer, p. 532.

duplication which the bureau system encouraged and the difficulties in coordinating departments.

Demonstrations of those difficulties can be found at the Boston Navy Yard in small and large forms. Work on battleship turrets and fire control systems occasionally became impeded because of the involvement of three or four departments.

A minor example of the impediments arising from decentralization arose in connection with a 40-ton traveling crane erected around the new dry dock. Yards and Docks operated the crane, although Construction and Repair had primary use of it. Yards and Docks workers, including the crane fireman, began work each day at the same time as most employees in other departments. Getting up steam on the crane required about an hour, during which time Construction and Repair shipfitters were without the services of a crane. Naval Constructor Elliot Snow recommended that either the crane fireman report for work an hour early or that the operations of the crane be turned over to Construction and Repair. Yards and Docks would not surrender a part of its cognizance, and the crane remained in its custody. To have the crane ready for service at the morning bell, it was necessary for the naval constructor in advance to file a formal request indicating the specific date. That system did not work, and Snow continued to complain of "the dilatory service rendered" by Yards and Docks. He stated that on October 5, 1906, his department "lost from $25.00 to $35.00 by having a gang of men standing around and waiting for the service of the 40-ton crane." Although a small matter, the situation demonstrates the

inefficiencies in navy yards caused by decentralization.[5]

One way to achieve change in the yards was by reformation of the bureau system. In 1899 and 1900, Secretary of the Navy John D. Long recommended consolidation of the Bureaus of Construction and Repair, Equipment, and Steam Engineering into one agency, "which might appropriately be called the Bureau of Ships." Long argued for that merger primarily because of difficulties generated by the existing arrangement in the design and construction of modern battleships. However, he also favored bureau consolidation, since it would

> reduce the supervisory, mechanical and clerical force in every navy-yard, and thus save great and unnecessary expense. At present each of the bureaus in question has at each yard its separate shops, inspectors, foremen, and workmen, all doing the same kind of work. No private business is run on such a wasteful and inharmonious plan.

Long's recommendation received no support, and the bureaus endured, except for Equipment.[6]

The cognizance of the Bureau of Equipment was first eroded, as some of its functions were assigned to other bureaus, and then eliminated. In 1909, the purchase, transportation, and storage of coal, other fuels, and water were assigned to the Bureau of Supplies and Accounts. Congress provided for the termination of the Bureau of Equipment in 1910 and formally abolished it in 1914.[7] Although the other bureaus persisted, navy yards were nevertheless reformed and reorganized, with the aim of

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5. Naval Constructor to Commandant, Aug. 6, 1906 and Oct. 5, 1906, both in 181-16, Box 17, vol. for Oct-Dec 1906, pp. 44, 47.

6. ARND 1900 (FSS #4098), pp. 28-9.

7. General Order No. 13, Feb. 24, 1909, 181-39, Box 14, #3503.

eliminating duplication at the departmental level.

Beginning in 1908, the yards experienced four somewhat distinct efforts to reform them. In the spring of 1908 came a modest merger of shops. There followed, at the end of the same year, a major reorganization instituted by Secretary of the Navy Truman Newberry. The Newberry scheme merged all of the mechanical departments into a single Department of Manufacturing. In a third change in 1909, Newberry's successor, George von L. Meyer, dismantled parts of the reorganization. Three years later, the yards were ordered to adopt a new system of shop management. As a result of these reforms, the administration and organization of the Boston Navy Yard changed in significant ways in the years before the beginning of the Great War.

Consolidation of Power Plants and Shops, 1908

Duplication by various departments of shops, tools, clerical forces, and manual laborers constituted an obvious problem in navy yards at the beginning of the century. That aspect of yard inefficiency was assaulted in 1908, preliminary to a more sweeping change in 1909. Essentially, the assault focused on shops as broadly defined, that is as entities occupying buildings or parts of buildings; having machinery, tools, equipment, and supplies; and employing manual workers under the supervision of foremen or master mechanics. The first target for elimination of duplication was the production of electrical power.

A consolidation of power plants at the various navy yards was authorized by Congress in April 1904. One year later, Secretary of the Navy Paul Norton directed the Chief, Bureau of

Yards and Docks, to undertake that project. The legislation and the Secretary's directive required the consolidation in each yard of all power plants "under the Bureau of Yards and Docks for the generation of light, heat, and power and for all the purposes of the Navy." Although the consolidation was to proceed as rapidly as practical, more than three years passed before a central power plant operated in the Boston Navy Yard.[8]

By 1907, the Boston yard contained, was building, or had plans for a total of six electric power plants. Yards and Docks had custody of the temporary power plant in Building No. 95, which produced electricity for lighting yard buildings and streets and for driving the pumps of the dry docks. That department would also operate the permanent plant to be located in Building No. 108. For the machinery of its shops, Construction and Repair included a power station in its new smithery, Building No. 105. When the ropewalk changed from steam to electricity, the Equipment Department built a separate power plant in Building No. 96. Not to be outdone, Steam Engineering planned to install generators in the northern wing of Building No. 42, when that became vacant. Yet another power plant appeared in Building No. 134 to serve the receiving ship Wabash. Each department employed firemen to run the boilers and electricians to oversee the generators and requisitioned and stored coal.[9]

Separate departmental power plants ended in April 1908, when

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8. Secretary of Navy to Bureau of Yards and Docks, Feb. 16, 1905, 181-27, Box 8, vol. for Dec. 13, 1900-Nov. 21, 1908, p. 115.

9. Steam Engineering never obtained its own generators, but all the other plants came into existence between 1899 and 1906.

the generators of the Departments of Construction and Repair and Equipment shut down. By that time also, the temporary plant in Building No. 95 ceased operations, and practically all power for the yard came from Building No.108, now known as the Central Power Plant. A few years later, the Wabash plant in Building No. 134 stopped running, the structure being turned over to the general storekeeper. Boilers, generators, and other equipment from the closed plants were transferred to the central station, which also was becoming the yard's source of heat and compressed air.[10]

During the spring of 1908, other consolidations took place. On March 9, all carpenters and painters were transferred to the joiner and paint shops of the Department of Construction and Repair. On the same date, all patternmaking and foundry work were merged into the pattern shop and foundry of Steam Engineering. Consolidation in the following May brought all plumbers into the Construction and Repair plumbing shop, all coppersmiths into the Steam Engineering copper shop, and all other smiths, except anchor and chain makers, into the Construction and Repair smithery.

The consolidations of March and May 1908 terminated entire shops, such as the Equipment foundry and the Construction and Repair foundry and pattern shop. It ended certain activities in some departments. For example, Yards and Docks lost its house joiners, painters, and plumbers. Henceforth, when Yards and Docks required the services of painters, carpenters, or plumbers,

10. AREO, 1908.

it obtained them through labor requisitions on the Department of Construction and Repair. The Departments of Yards and Docks, Equipment, and Ordnance lost men and had shorter payrolls. Construction and Repair and Steam Engineering gained workers. The mergers of March and May required the transfer from one department to another of approximately 125 employees.[11]

In restricting certain types of work to one department, consolidation eroded the autonomy navy yard departments previously enjoyed. In that respect, consolidation had important long-range implications. In the short run, the transfer of men and equipment and the closing of some shops presented administrative problems.

Commandant William Swift made it clear that the affected men were being transferred and would not lose their jobs or suffer interruption in the continuity of their service. In the mergers of carpenters, painters, patternmakers, and molders in March, Swift ordered the discharge of the workers from their former departments as of the final bell on Saturday, March 7. He advised their new departments that those workers "will be taken up on Monday, March 9." Naval Constructor Snow issued a series of orders to foremen in the Construction and Repair Department, instructing them to have the transferred patternmakers and molders ready at 3:00 p.m. on Saturday "to go with their complete tool outfits, working clothes, etc. to Steam Engineering shops

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11. Naval Constructor, Notice to Foremen, Mar. 5, 1908; Naval Constructor to Commandant, Mar. 3, 1908 and Mar. 4, 1908; Order, May 5, 1908; Head, Department of Steam Engineering to Commandant, May 6, 1908, all in 181-38, Box 1. Other documents dealing with shop consolidation are also in this file.

and report in person to the Steam Engineering foremen." At the new department, the men would receive new assignments and check numbers, so as to be ready on Monday to check in as "Steam Engineering employees."[12]

Arrangements also had to be made for the transfer of shop files and records, stock and material, and tools, other than those carried by workers. In addition, there was the problem of work being done by men to be transferred which was not completed by Saturday afternoon. Job orders issued under one department had to be made acceptable to the new department. The orders for consolidation stipulated that men "habitually employed in certain fields of work" should be assigned by their new department "to the work they are now doing." This meant, for example, that a Yards and Docks painter, who had worked on building interiors, should not be assigned by Construction and Repair to painting a ship in dry dock. Apparently the transfer on Monday, March 9, occurred without incident.[13]

The records do not indicate the reaction of the seventy-five painters, carpenters, and molders transferred in March or the fifty smiths and plumbers transferred in May. Naval Constructor Snow displayed energy and enthusiasm in the process and called upon his foremen "to heartily cooperate toward making this first move toward consolidation a success." Other department heads did

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12. List of Employees in Construction and Repair Department to be Taken Up by Steam Engineering, Mar. 5, 1908; Naval Constructor, Notice to Foremen, Mar. 3, 1908, both in 181-38, Box 1.

13. Naval Constructor, Notice to Foremen, Mar. 3, 1908, 181-38, Box 1.

not favor the consolidation. In a review of his department's operations in fiscal year 1908, the civil engineer dryly noted that "the only change in Yard organization ...is that Yards and Docks has been deprived of its painter, toolmaker, wheelwright, and plumber...." Mounting complaints by workmen about a variety of issues beginning in 1908 suggest a general uncertainty and dissatisfaction with consolidation.[14]

No reduction in the yard payroll resulted from the shop consolidations in the spring of 1908, since employees simply were shifted from one department to another. The process emptied one building, No. 16, the Construction and Repair foundry, which the general storekeeper took over. According to the head of Steam Engineering, the planers, saws, and lathes, formerly in the Construction and Repair pattern shop, matched precisely the needs of the pattern shop of his department and made it "efficient for all the purposes which may be required."[15] Although the gains appear modest, a beginning had been made in eliminating duplication. Before further steps could be taken in the merger of shops, the entire administration of the yard was involved in a radical reform.

The Newberry Reform and the Manager System, 1908-1909

Truman H. Newberry, Assistant Secretary of the Navy during much of Roosevelt's second term, was elevated to full Secretary in December 1908. He expected to be retained in that post after

14. AREO, 1908; Naval Constructor, Notice to Foremen, Mar. 3, 1908, 181-38, Box 1.

15. Head, Steam Engineering, to Commandant, May 6, 1908, 181-38, Box 1.

the inauguration of William Howard Taft on March 4, 1909. As Assistant Secretary, Newberry had become attracted to the ideas of scientific industrial management, identified with Frederick W. Taylor. Those principles gained support from some officers, especially members of the Construction Corps. Prominent among Taylor enthusiasts was Rear Adm. W. L. Capps, Chief, Bureau of Construction and Repair. Shortly after his appointment as Secretary, Newberry assigned Capps additional duties as Chief of the Bureau of Steam Engineering. Thus a consolidation was achieved in Washington, giving prominence to the Construction Corps.[16] Newberry sought a similar change in the navy yards.

The Newberry plan of navy yard reorganization was contained in General Order No. 9, issued on January 25, 1909. It stipulated that, as of February 1, all of the mechanical departments, all yard labor, all buildings and grounds, and all civil engineer work were to be placed in a consolidated unit, the Manufacturing Department. The naval constructor in each yard, formerly head of the Department of Construction and Repair, became "Manager" of the Manufacturing Department and "the principal technical assistant to the commandant." The heads of the former Departments of Ordnance, Equipment, and Steam Engineering "may remain on duty under the title and discharge the functions of inspector of ordnance, inspector of equipment, inspector of machinery." The civil engineer was to be attached to the commandant's office as "consulting engineer and inspector of public works." The four inspectors "could retain such clerical

16. Furer, pp. 524-5; Paullin, p. 479.

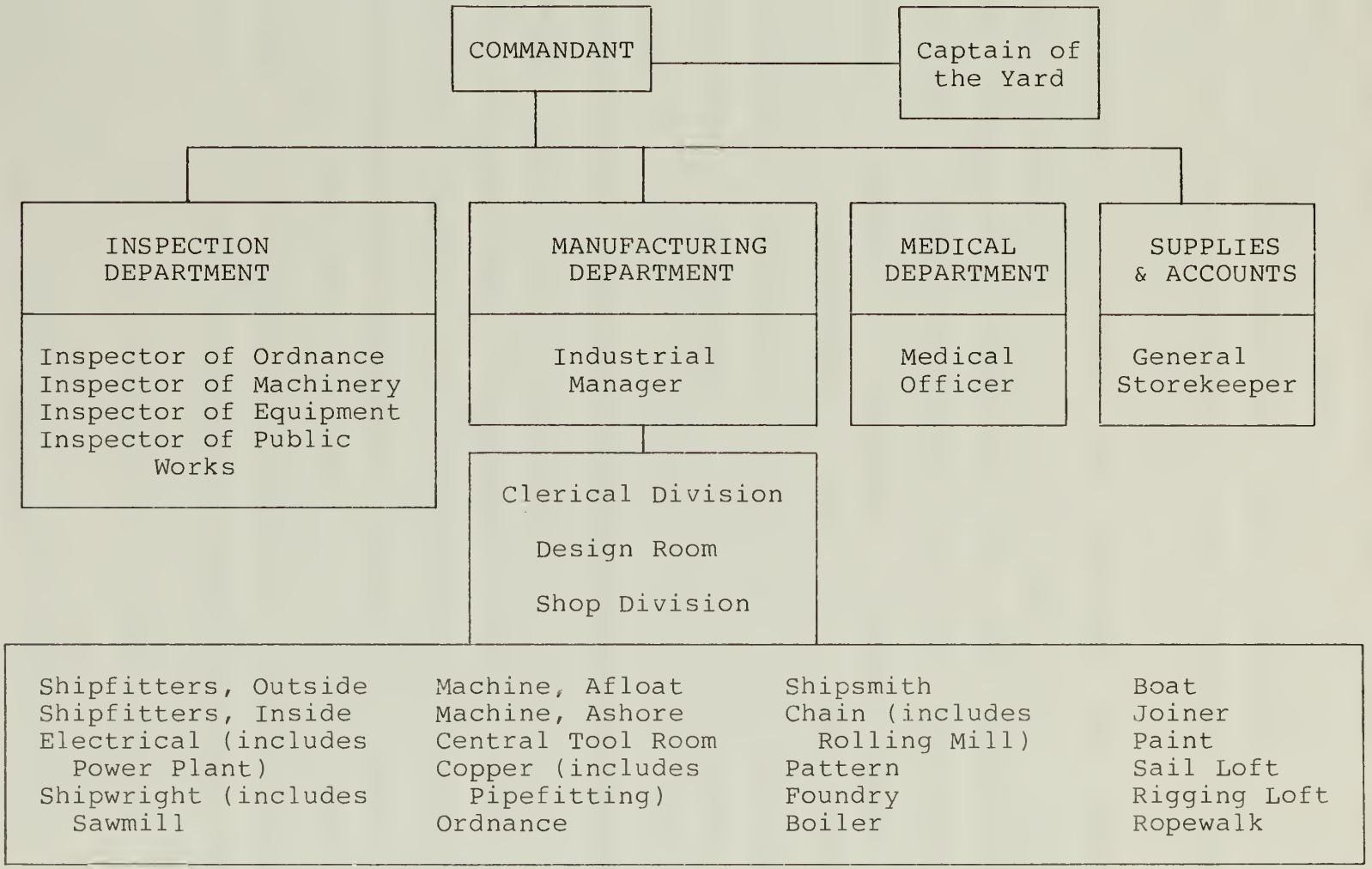
staff and such assistants" as the commandant regarded necessary for them to carry out their duties. Order No. 9 made no changes in the status and duties of the captain of the yard, general storekeeper, medical officer, pay officer, and officer in charge of provision and clothing.[17]

At the Boston Navy Yard, the Newberry plan temporarily elevated Naval Constructor Elliot Snow to a position of preeminence, overshadowing all other officers, including Commandant William Swift. Snow and Swift set out to bring about a reorganization of the yard. Whereas Snow had issued a half dozen sets of instructions to his foremen in accomplishing the consolidation of four shops in the previous March, he immediately issued thirty "General Notices" and twenty "Special Notices" in late January and early February 1909. Those notices implemented a system placing all important industrial functions in the yard in the hands of members of the Construction Corps. Snow, "Head of the Manufacturing Department and Principal Technical Aide to the Commandant," had one naval constructor and two assistant naval constructors as his assistants. Collectively, they supervised generally and immediately work on all warships and in all shops except woodworking. In their charge also were "the drafting room, personnel requisition, and estimates."

Two other commissioned officers briefly had positions in the Manufacturing Department. "All work immediately connected with the Inspector of Public Works involving...appropriations of the Bureau of Yards and Docks" was assigned to the civil engineer,

17. General Order No. 9, Jan. 25, 1909, 181-101, Box 1, #2001-1.

Administration Table No. 2: BOSTON NAVY YARD, JULY 1909
(THE NEWBERRY REORGANIZATION)



who also supervised the power plant and woodworking shops. A passed assistant engineer, formerly in Steam Engineering, had oversight of repair work on yard craft, auxiliaries, and militia vessels. By October 1909, both the civil engineer and the passed assistant engineer had been reassigned outside the department, their places being filled by two additional naval constructors.[18]

The Manufacturing Department included a large clerical division, the drafting room, and a force of shipkeepers and watchmen. More importantly, all of the shops and the yard's entire manual labor force came under its authority. Accordingly, Snow was free to continue the merger movement. He consolidated all riggers, laborers, stevedores, and masons into a single shop; all machinists into a main machine shop; all electrical work under two master electricians, one for work afloat and one for work ashore; and all small tool work in a central toolroom. He abolished the recently consolidated plumbers shop and placed all plumbers and pipefitters under the master shipfitter, inside.[19]

On February 11, Snow reported that his new department was "in fairly smooth running order." That view was not shared by officers outside the Manufacturing Department, especially those now assigned as inspectors of equipment, machinery, and ordnance. All of these were officers of the line, and it appeared that the Newberry system removed line officers from positions of importance in navy yards. Throughout the Navy in 1909, protests

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18. Manager, Manufacturing Department, Oct. 15, 1909, 181-39, Box 1, #2101.

19. Naval Constructor, Organization of the Manufacturing Department, Boston, Feb. 11, 1909, 181-39, Box 1, #2001.

by the line mounted against the reorganization, producing what the New York Times described as "one of the most bitter controversies in the history of the navy."[20] Generally, the press pictured a contest between staff and line officers. Probably the severest criticism of the rearrangement of the Boston yard came from Capt. William R. Rush, Ordnance Inspector and destined to become yard commandant in 1914.

Reorganization of the navy yards left the former heads of the Departments of Ordnance, Steam Engineering, and Equipment without any genuine authority over work done under the cognizance of their bureaus. They could inspect such work, but could not supervise it. Commandant Swift stated: "It is important that Inspectors shall give the Manager of the Manufacturing Department and his Assistants the benefit of their advice and experience upon work going on in the shops...."[21] As to be expected, this advisory capacity rankled men accustomed to being in command.

Uncertainty prevailed as to the continuation of the Newberry system after its author had been replaced by George Meyer in March 1909. Meyer collected information and recommendations from a wide variety of sources, including by means of a questionnaire circulated among officers in the navy yards. At Boston, Commandant Swift favored the system, but in a guarded and hesitant fashion. The naval constructor, as is to be expected, spoke highly of it. And the inspectors criticized most aspects of the Newberry plan. The recommendation of the Inspector of

20. New York Times, May 18, 1909, p. 2, and May 20, 1909, p. 3.

21. Commandant, Rules Governing Inspectors, Feb. 23, 1909, 181-39, Box 1, #2001-1.

Equipment was to return to arrangements prevailing before the reorganization. Captain Rush, Inspector of Ordnance, lamented that in the new system, the ordnance master mechanic, who previously had charge of ordnance work, was replaced with assistant naval constructors, "who are now issuing orders direct to quartermen and leadingmen." "Ordnance," claimed Rush, "is a distinctly technical branch of the navy profession, and cannot be learned by any gentleman at school." He contended that

> the Master Mechanic in Ordnance at the Navy Yards is a very much more valuable person to the Bureau of Ordnance than an accomplished and well instructed assistant Naval Constructor; a gentleman, who, however charming, has specialized, very naturally, in his own branch, i.e., shipbuilding.... The consolidation plan has proven to the calm, reflective minds of all who are interested, its impracticability....

Rush further concluded that "no business concern standing on its own bottom, and unsupported by financial aid, would stand by for any length of time under a like arrangement."[22]

Having the naval constructor at navy yards serve as manager did not survive. George Meyer, the new Secretary in March 1909, had doubts about parts of his predecessor's program. The Attorney General of the United States ruled illegal Admiral Capps' being chief of both the Bureaus of Construction and Repair and of Steam Engineering. Many navy yard commandants lacked enthusiasm for the Newberry scheme, and most line officers opposed it. Shortly after Newberry left office, line officers stationed at League Island or attached to ships then at that yard held a meeting on USS Panther, at which they discussed

22. Commandant to Secretary of Navy, Apr. 16, 1909, 181-39, Box 1, #2001.

alternatives and ways to bring about change. These events led to a modification of Newberry's reorganization.[23]

The Meyer Modification

In November 1909, Secretary Meyer promulgated alterations in existing Navy regulations, including provisions governing navy yard organization and administration. Meyer eliminated the position of manager, although, at least in Boston, the term "General Manager" was retained and assigned the commandant. Also the utility of the position of manager received continued recognition, and it would reappear after World War I. The orders of November 1909 retained the Manufacturing Department and stipulated that that department would be the employer of all manual labor in navy yards, except workers of the general storekeeper and the medical departments. A major difference between the Newberry and Meyer systems was that the latter provided for two divisions within the Manufacturing Department, a Hull Division, headed by the naval constructor, and a Machinery Division, headed by the yard's senior officer detailed to engineering duties. These two divisions were in essence the former Departments of Construction and Repair and Steam Engineering.[24]

There was no resurrection of the old Departments of Equipment and Ordnance, their shops, personnel, and functions being absorbed by one or the other of the two divisions in the

23. Furer, pp. 524-5; Paullin, p. 479.

24. Changes in Navy Regulations No. 6, Nov. 11, 1909, 181-39, Box 1, #20051.

Manufacturing Department. The Meyer plan did revive the Department of Yards and Docks, soon to be called Public Works. Formally, Yards and Docks had no shops or manual employees, although in practice there was a sizeable shop of diverse workmen. Formally and in actuality, Yards and Docks lost custody of the central power plant, now one of the shops of the Machinery Division.

Scientific Management, 1912-1913

In the fall of 1912 began a fourth round of navy yard reform. Unlike the early three, which focused on mergers and consolidation of shops and departments, the latest effort emphasized methods of industrial management at the office level and the application of techniques to save time and motion by men and machines in the shops.

The writings of Frederick W. Taylor, a former steel company foreman and engineer, popularized time studies and scientific industrial management. Taylor sought to lower the costs of production, not by cutting wages, but by the introduction of carefully devised routines to save the energy and time of workmen. With stop watch and notebook in hand, Taylor and his followers studied the procedures of the most efficient workers in a shop and set the time elapsed as the minimum standard for all workmen engaged in the same task. Taylorism went beyond the performance of individual employees and directed attention to the layout of shops, the adequacy of equipment, the flow and handling of material, accounting practices, and the performance of management itself. Management required more than assigning tasks

to workmen and then allowing them to proceed in their own fashion. It meant instructing them in scientific routines and constantly checking performance. Taylor's ideas created a need for industrial managers, planners, estimators, and progressmen.

Taylorism found support within the Navy, both on the part of civilians, such as Secretaries Newberry and Meyer, and officers, especially the Construction Corps. One enthusiast was Naval Constructor Holden Evans, Manager of the Manufacturing Department at Mare Island during the brief-lived Newberry experiment. Evans revolutionized the calking of decks by mounting calkers on wheeled stools, which enabled them to increase their daily output from eighty to 400 feet. He also reduced the cost of retubing destroyer boilers from $1100 to $400 by using oil instead of coal in blacksmith shop forges.[25]

In the first half of 1912, the Navy experimented with the so-called Vickers system of shop management at the Norfolk Navy Yard. Norfolk workmen reacted heatedly, but on the basis of that experiment, modifications were made and tested in the Machinery Division at Philadelphia and the central office of Puget Sound. In October 1912, the Department ordered all yards to change to the modified Vickers system. That change entailed the establishment of a central office in each yard's Department of Manufacturing.[26]

That office was to contain three sections. A planning and

25. Lott, pp. 149-51.

26. Commandant to Officers of the Yard, Oct. 15, 1912; Revised Directions for Installing New System of Shop Management, Oct. 1912, both in 181-39, Box 12, #3701.

estimating section had the function of analyzing requests for work; breaking them down into the principal steps; preparing job orders, auxiliary job orders, and shop orders; preparing material lists, requisitions, and estimates of time and cost of work; and providing drawings and specifications in cooperation with the drafting room.

A second section, the progress section, included a chief progressman, located in the central office, and shop and ship progressmen, in the department's shops and on the ships at the yard under repair. The progress section had the duty of "properly following up work, that is keeping track of the progress of work and expediting its completion." The third unit in the central office was the examiners' section. Examiners were charged with studying machine tool performance to obtain data for standardization of operations. Based on their findings, examiners would supervise adjustment of the feed and speed of those machines and determine, with shop foremen, the proper routing of work to the machines.

The commandant of the Boston Navy Yard, Capt. Dewitt W. Coffman, ordered the new system established as of January 2, 1913. Subsequent developments suggest he did so with misgivings. At any rate, creating a central office marked the last significant administrative change in the yard until after World War I.[27]

Organization of the Yard in 1913

Between the end of the Spanish-American War and the

27. Order No. 144, Dec. 24, 1912, 181-39, Box 12, #3701.

beginning of the Great War, the Boston Navy Yard became a larger and more complex institution. No longer did the array of departments duplicate precisely the bureau system in Washington. Some departments had disappeared, and others had come into being, namely the Pay, Accounting, and Manufacturing Departments, the last consisting of the former Departments of Steam Engineering and Construction and Repair. The elimination from the yard of the Departments of Equipment and Ordnance was complete, both in name and fact. Not even inspectors of ordnance or equipment survived. After its removal under the Newberry scheme, the Department of Yards and Docks returned, redesignated as of May 1, 1911, as the Public Works Department. It regained its employees, including painters, plumbers, and carpenters, who had been merged into consolidated shops in 1908.

In the year before the beginning of the war in Europe, slightly more than 2000 people worked at the Boston Navy Yard, not counting the Marine Corps detachment, receiving ship, and off-yard operations, such as the hospital at Chelsea and the magazine at Hingham. A table of organization for 1913 lists 2083 positions at the yard, fifty-two filled by naval officers and enlisted men and the remainder by civilians. Of those civilians, 222 worked in or out of the yard's offices and 1809 in the shops.[28]

The offices of the commandant and captain of the yard had grown since the 1890s, when chief clerk John Hudson single-

28. These figures and the discussion which follows are based on information provided in Outline of Organization, 1913, 181-39, Box 127, #112.

handedly cared for the commandant's correspondence, and the captain of the yard had no clerical assistance whatsoever. In 1913, Commandant Coffman's clerical and messenger staff consisted of thirteen people, four of whom maintained the central files. Those files served the commandant, the Manufacturing Department, and, by January 1914, the captain of the yard and the accounting, inspection, and public works officers.[29] Attached to the commandant's office as aide and second in command was the captain of the yard. That officer directed the activities of six Marine Corps orderlies, who manned the telephone exchange; five watchmen, who guarded "public property"; and twenty shipkeepers, who served as watchmen-custodians on ships in ordinary and in buildings of the Hull Division. Three warrant officers aided the captain of the yard.

The smallest departments were Medical, Pay, and Accounting. The dispensary personnel consisted of a medical and an assistant medical officer, four naval stewards and hospital apprentices, and a civilian attendant. The yard's Pay Department had the same general size. It included a pay officer, a naval pay clerk, and four civilians. Twenty-three civilian clerks and other office workers, a navy paymaster's clerk, and the accounting officer constituted the Accounting Department.[30]

Steady growth, beginning in the 1890s, increased the once

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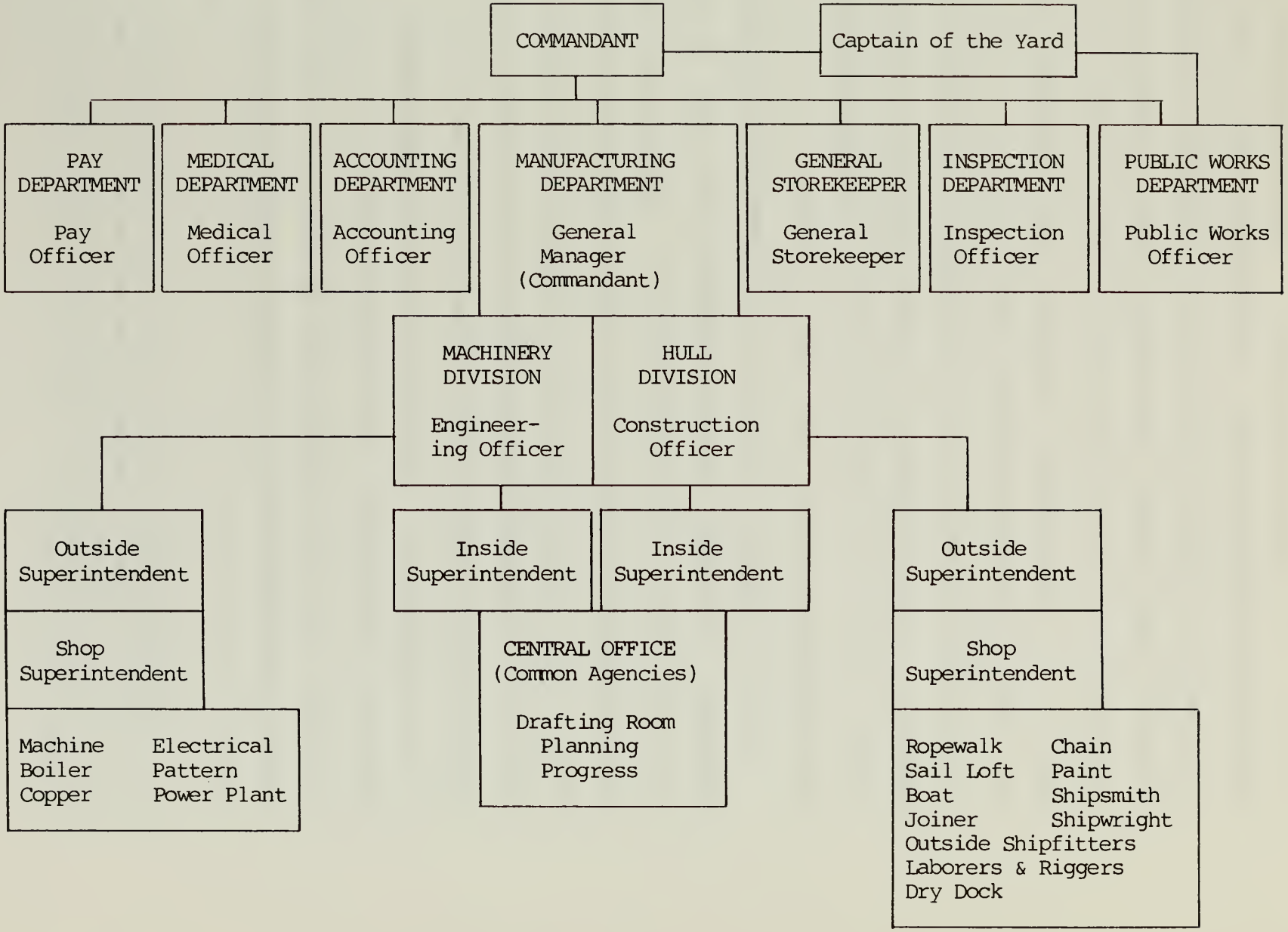
29. Order No. 144, Dec. 24, 1912, 181-101, Box 12, #3701.

30. During fiscal year 1910, the Navy engaged the firm of Mariwood, Mitchell & Co. to design and install a cost accounting system for the service. That firm studied conditions at the Boston Navy Yard and made recommendations leading to a system of uniform monthly reports submitted by the accounting officer; ARND, 1910 (FSS #5922), pp. 12-3.

Administration Table No. 3: BOSTON NAVY YARD, 1913



minute General Storekeeper's Department to a total of 143 people in 1913. The General Storekeeper, a navy paymaster, had an office staff of thirty-seven, including the yard's four chemists. The department maintained an ordnance storehouse, which employed a manual labor force of five ordnance men, and several general storehouses, in which worked forty-eight pressmen, coopers, box makers, packers, wiremen, laborers, and helpers. In addition, the General Storekeeper had a group of fifty laborers, directed by a quarterman laborer, who performed "miscellaneous work" on behalf of the department. A chief boatswain supervised the coaling plant, utilizing laborers from the "miscellaneous work" crew when needed.

Like the General Storekeeper's Department, the Public Works Department employed manual workers. A note in the 1913 organization table reads: "Designation `Public Works Shop' used in a functional sense only; Public Works has no shop."[31] Whatever, the formal understanding, Public Works did have a shop, headed by a foreman mechanic and consisting of eight units, some of which included quartermen and leadingmen. Public Works manual workers totaled 146. The office staff was composed of clerks, messengers, draftsmen, and subinspectors for contract work, estimating, and yard inspection. Building No. 107, originally intended entirely for the old Yards and Docks Department, still housed the Public Works offices, although the general storekeeper

31. That Public Works had no shop was an administrative fiction required by the perpetuation by Secretary Meyer of that part of the Newberry scheme providing that all manual labor was in the employ of the Manufacturing Department, except workers of the GSK and Medical Departments.

used part of the structure for a storehouse. The Public Works workshop was in Building No. 4.

In 1913, the Boston Navy Yard Inspection Officer, a commander, was charged with the responsibility for inspections other than those involving ships under repair or public works. Periodic inspections were required of ships in ordinary and of material in the custody of the general storekeeper. In addition to its head, the Inspection Department consisted of four assistant inspectors, all warrant officers, and four acting-subinspectors, all of whom were either shipfitters or machinists. Four employees made up the department's clerical force. Essentially, the department and its members performed tasks assigned by the commandant.[32]

All of the departments discussed thus far generally functioned as supports for the major unit in the yard, the Manufacturing Department. That department monopolized the main purpose of navy yards, the repair and, occasionally, the building of ships. A board of inspectors visiting the Boston yard in the spring of 1913 concluded that the Navy's orders of October 12, 1912, "respecting industrial management, is probably being carried out more scrupulously in letter and spirit than at any other Navy Yard." In other words, according to the inspection board, the Manufacturing Department conformed to the latest reform.

The principal features of the Manufacturing Department, as evident in the 1913 table of organization, were its size, the

32. Changes in Navy Regulations No. 6, Nov. 11, 1909, 181-39, #20051.

absence of a single officer as its head, the clear distinction between Hull and Machinery Divisions, and the several levels of intermediaries between those in charge and the men who actually did the work in shops and on ships. Moreover, regardless of what Frederick Taylor had in mind, the yard recruited its central office personnel, that is planners, estimators, and progressmen, from the ranks of its skilled mechanics.

The Manufacturing Department essentially consisted of the former Departments of Construction and Repair and Steam Engineering, with the addition of functions, personnel, and shops previously associated with the Departments of Ordnance and Equipment. Throughout the table of organization, from the division heads down to the shop level, positions are clearly identifiable, in practically all instances, as either with the Hull Division or the Machinery Division. Structurally no person had authority in or over both divisions, except the commandant, carried as the department's "General Manager."

Beneath the commandant stood the heads of the two divisions, the Construction Officer and the Engineering Officer. Next came three "common agencies," the central office organization of the 1912 orders. General supervision of those agencies rested with two officers, the inside superintendent for the Hull Division and his counterpart for the Machinery Division. The Boston yard's central office, differing from that described in the 1912 orders, consisted of three sections: drafting, planning, and progress.

Other than a chief draftsman and his assistant, the drafting room was divided into ten draftsmen for the Hull Division and

four for Machinery, one of whom specialized in ordnance. In the planning section, the distinction between divisions was even more evident. Immediate supervision was provided by two officers, a planning superintendent for each division. The key subordinates were twenty planners and estimators, ten for each division. All of the twenty planners and estimators held ratings as mechanics, some as master workmen or leadingmen. The progress section was evenly split, three progressmen for the Hull Division and three for Machinery. Each progressman was responsible for a group of shops. Like the planners and estimators, progressmen held ratings as mechanics.

The Hull and Machinery Divisions shared the common agencies, but each also had separate office organizations consisting of identical sections, services, or groups. These included a general clerical service, composed of a chief clerk and five other clerks; a one-man material inspection group; and an examiner's section, again consisting of a single individual, a quarterman shipfitter for the Hull Division and a leadingman machinist for the Machinery Division. Each of the examiners was responsible for studying machine tool performance in the shops of his division. Since it was patently impossible for any two men to keep track of all of the machine tools in the yard, the appointment of the examiners was probably a token organizational acknowledgment of Taylorism and the 1912 orders.

The great body of mechanics, helpers, and laborers of the Manufacturing Department were in the shop sections and the ship sections of the two divisions. Directing Hull Division work on board ship was an outside superintendent and an assistant outside

superintendent, both naval constructors. When in the shops, Hull Division workers came under the authority of a shop superintendent. The same arrangement prevailed for Machinery Division workers.

The 1913 table of organization makes no distinction between shops doing inside work and those engaged in work on ships. Rather the table contains a note to the effect that shop sections were "interchangeable with ship" and that on the average the ship section constituted one-third of the work force. The Hull Division had eleven shops, employing a total of 748 workers. Those shops and the number of men in each were as follows: ropewalk (96), chain (39), sail (16), paint (28), outside shipfitters (240), boat (24), shipsmith (49), joiner (55), shipwright (73), laborers and riggers (125), and dry dock (3). The six Machinery Division shops were: machine (482), electrical (113), boiler (89), pattern (31), copper (40), and power plant (58).

Master mechanics headed each shop, except for the ropewalk, which continued to have a superintendent; the laborers and riggers shop, directed by a foreman laborer; and the three-man docking crew. The machine shop, the yard's largest shop, had two master machinists and one master mechanic of ordnance. All but three shops included quartermen and/or leadingmen. In most shops, mechanics, that is skilled workers, outnumbered helpers and laborers. Most shops, especially the large ones, had a mixture of ratings. For example, the outside shipfitters shop, the largest in the Hull Division, included shipfitters, drillers, riveters, machinists, holders-on, calkers and chippers, sheet

metal workers, acetylene welders, punchers and shearers, plumbers, galvanizers, and electroplaters. Small shops, of course, had less diversity. The paint shop of Building No. 125, for example, consisted of a master painter, a leadingman painter, twenty painters first class, one painter in each of the three other classes, one varnisher and polisher, and two painters' helpers.

The table of organization lists all positions in the yard, commencing with the commandant and ending with the shops. Organizationally, the distance between these two levels had increased since the 1890s. A mechanic in one of the larger shops probably worked directly under a leadingman, above whom was a quarterman and then the shop's master mechanic. Beyond the shop organization, Navy officers appeared, possibly an assistant outside superintendent and then the outside superintendent. Out of sight was the central offices, headed by an inside superintendent. Most remote was the division head and finally the commandant.

Assessing the performance of the organizational structure of the Boston Navy Yard in 1913 is probably impossible. In May 1913, after conducting an inspection of the yard and conferring with the commandant and other principal officers, the three-man board of inspectors made some highly general comments, particularly on the matter of industrial management. The board members held that since the Boston yard adhered closely to the order of October 1912, it would either be "the greatest beneficiary" or the "greatest sufferer," depending on the efficacy of the system. The board was inclined to the view that the yard would suffer. It noted "that the system ...neither

commends itself to the employees as a whole, nor to the heads of certain divisions of the yard." That fact "probably tells of its practical operations."[33]

The inspectors recommended that the system's "Office Procedures and Shop Management methods" be abridged, since the "Examiners are wholly unnecessary, and the Progressmen could be dispensed with to a great extent...." They also concluded there should be a reduction in "the number of intermediaries between the Heads of the Manufacturing Department and the workmen employed in the shops and on the ships." The inspection board contended that a navy yard was not like a private industrial organization and that in navy yard work "economy of time" was of greater importance than "economy of expenditure."[34] Doubtless the report of the inspectors reflected the judgments of the authors and also of some of the yard officers. The real test of the yard's administration came with the vast increase in the volume of work and activity during the World War I era.

EXPANSION OF THE YARD'S FACILITIES

The years of 1900 to 1914 were important ones for the development of the physical plant of the Boston Navy Yard. The period witnessed a construction boom, forty new buildings being erected. The waterfront experienced substantial change with the addition of a large, modern dry dock; the acquisition of increased

33. Board to Inspect Navy Yard, Boston, Jun. 2, 1913, 181-39, Box 152, #6.

34. Board to Inspect Navy Yard.

wharfage; and the provision for weight-lifting apparatus. Elements of the "old yard" disappeared, such as the last of the shiphouses and the tall chimney of the machine shop complex. Expansion of the yard resulted in the introduction in 1902 of a system of assigning numbers to roadways. Of the twenty-five thoroughfares, only four had names. Roadways running east and west received designations as "Avenues"; and those running north and south, as "Streets."[35]

Dry Docks, New and Old

Construction of Dry Dock No. 2 required seven years, approximately a million and a half dollars, the efforts of more than one thousand workmen, 21,500 cubic yards of cut granite, and 100,000 barrels of cement. In 1898, the Navy awarded the contract for building the dock to O'Brien & Sheehan of New York City for $833,400. Farrell, Hopper & Co., also of New York, received the $130,000 contract for the machinery, including pumping plant, capstans, winches, and generators. The dock's caisson was built by Cramp and Sons of Philadelphia at a cost of $60,000. In the summer of 1902, O'Brien & Sheehan encountered difficulties, and the bonding firm, City Securities and Trust of Philadelphia, assumed responsibility for fulfilling the contract. Upon completion of the dock, the contractors claimed that it had cost them $250,000 above the contract figures. Some of their protests resulted in further compensation, and they hoped to obtain additional sums through legal action. According to the

35. Boston Globe, Feb. 13, 1902, 181-83.

New York Times, the contract for the new Boston dry dock was the largest yet awarded for work in any navy yard.[36]

Accidents and the problems of O´Brien & Sheehan delayed completion of the dock by a year or more. Construction began on April 22, 1899, when mule-drawn scoops started the excavation at the head of the dock and dredges began digging up the harbor bottom. To seal off the site to be occupied by the dock, the contractors built a massive cofferdam from shore to shore and extending out into the harbor around what would become the dock´s entrance. The dam was a crib, made of hard pine and spruce timbers bolted together. The crib, which averaged twenty-five feet in width and forty-four in depth, was set in a dredged trench and filled with clay. On December 8, 1899, while under construction, a forty-five-foot section of the cofferdam collapsed. Four months later, when the cofferdam neared completion, an even longer section failed. A third accident happened on August 6, 1900. By that time the cofferdam was finished, and two weeks of pumping had removed the water to a depth of fourteen feet below mean low water. The failure occurred in a section recognized as the weakest in the structure, where the west end of the cofferdam extended onto shore. Despite efforts to strengthen the works, part of the ground gave way, and the entire excavation was flooded by the high tide. The accident

36. New York Times, July 23, 1902, p. 3. This discussion of Dry Dock No. 2 is based on information contained in ARND, 1899 (FSS #3912), pp. 148-9; ARND, 1900 (FSS #4098), pp. 237-8; ARND, 1901 (FSS #4286), pp. 147-8, 198; ARND, 1902 (FSS #4455), p. 117; ARND, 1903 (FSS #4642), pp. 108, 141; ARND, 1904 (FSS #4956), p. 20; ARND, 1906 (FSS #5115), pp. 155-6, 574; AREO, 1899-1906, 181-154; Boston Herald, Mar. 3, 1905, 181-83.

resulted in a long delay, and pumping did not resume until December.[37]

The O'Brien company's financial difficulties caused slowdowns in work, particularly after April 1, 1902, by which time the excavation had been completed and the masonry work had begun. On June 20, work on the dock ceased completely. Negotiations between the Navy, O'Brien & Sheehan, and the bonding company led to an arrangement whereby construction resumed. Several months later, City Securities and Trust took over the obligation to finish the dock.

That firm, quite prematurely, announced completion in February 1905. During the docking of Maryland in the following August, a Navy board found a number of defects requiring correction. On March 23, 1906, New Jersey entered the dock, being undocked two days later. Another warship, Texas, tested the dock in April. That apparently proved the facility worked to the satisfaction of the Navy, which on May 6, formally accepted the facility, while still occupied by Texas. During the remainder of May and June, the dock received, in succession, a cruiser and four more battleships, and the dock can be said to have actually begun to function.[38]

Dry Dock No. 2 is probably the largest single construction project ever undertaken at the main site of the Boston Navy Yard. To make the excavation, 250,000 cubic yards of material were removed, even though most of the site was underwater. The

37. Undated article in unknown newspaper, 181-83.

38. Docking Log, 181-60.

resulting hole measured 1000 feet in length, fifty-four in depth, and 160 in width at the bottom. The floor of the dock rests on solid rubble concrete, thirteen feet thick. Some of the rubble is granite block from the yard's old sea wall. Above the concrete and rubble were laid courses of granite stone, making a floor six to eight feet thick. The stone used throughout the dock is of unusual hardness and heavy specific gravity, having been quarried in the White Mountains near North Conway, New Hampshire. Those quarries were opened and developed specifically for the Boston dock. Altogether, 11,200 cut stones went into the facility. At times, the workmen in the quarries and those constructing the dock totaled more than one thousand.

The dock can be viewed as a large inverted arch, its walls running almost straight down to the concave floor. This differs from Dry Dock No. 1, which has sides consisting of yard-wide steps or altars leading to a flat bottom. A vertical line from the top of Dry Dock No. 2's coping to the floor measures thirty-nine feet. In 1906, there was thirty-four feet of water over the bottom of the dock at mean high water and thirty feet, seven and one-half inches over the sill. The dock has a length of 750 feet at the coping, from the head to outer sill, and an entrance width, at the coping, of 101 feet, nine inches. A drainage system was built into the floor of the dock. Four eight-foot culverts in the concrete foundations run almost the entire length of the dock and are provided with openings to the floor every twenty feet. The four culverts empty into a cross culvert, which discharges into a great pump well. Above the pump well is a

small circular structure, Building No. 123, which housed the pumping plant. The plant originally consisted of two forty-eight-inch centrifugal pumps, powered by two 500-horsepower electric motors, and a pair of discharge pumps, driven by two seventy-five horsepower engines. The two main pumps could lift 65,000 gallons of water a minute and empty the dock in slightly more than one hour.

Other parts of the new dock included tracks along both sides and the head for a forty-ton crane. Two wharves, each sixty feet in width, were later built on either side of the dock's entrance, the eastern pier being 361 feet in length and the western 238 feet.

The building of Dry Dock No. 2 seems not to have interfered with the use of the yard's first dock. Each year of the new century, Dry Dock No. 1 received more vessels than it had during the war with Spain. Twenty-three ships were docked in 1900, twenty-nine in 1903, and thirty-four in 1905, the last calendar year before the new dock went into regular service. That increased usage and the forces of nature took their toll, but major repairs on the dock itself were postponed, pending completion of the new facility. In 1904, the yard's Construction and Repair Department completed a second caisson for Dry Dock No. 1. Plans of Dry Dock No. 2 had been modified to allow for a culvert connecting the two docks, so that Dry Dock No. 1 could be emptied by the pumping plant of the new dock. In July 1902, Congress provided $41,100 for that project, and, after the contractor had failed in May 1905, the 360-foot culvert was

finished by yard workers. Until the new pumping plant went into operation, the old one had to be repaired. For example, in 1904 work was done on the boilers in Building No. 22, including the installation of new grates manufactured by the yard's Steam Engineering Department.[39]

After Dry Dock No. 2 was placed in commission, repairs and alterations were made in the stone work and masonry of the older dock. Some of the masonry had become dislodged, especially in the grooves into which the caisson fit. That defect resulted in leaking of water, which required the drainage pumps to operate while vessels were being worked on in the dock. Repairs in 1907 stopped the leakage. In 1908, six hundred large stones were removed and reset, and the entire interior of the dock lined up in proper shape and pointed. Also a notch or recess was cut in the lower altar stones at the head of the dock, which increased its length by four or five feet. In the same year, an extremely high tide flooded the caisson, damaging a pumping engine, which had to be replaced. After the repairs to the dock and caisson, the civil engineer claimed that Dry Dock No. 1 was in better condition than when first built three-quarters of a century earlier. A few years later, portions of the stones at the head of Dry Dock No. 2 were cut and removed, so as to provide more working room. The caissons of both docks were periodically scraped and painted.[40]

In his annual report for fiscal year 1906, the Chief of the

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39. Docking Log; AREO, 1904; AREO, 1905.

40. AREO, 1906; AREO, 1908; AREO, 1911.

PHOTOGRAPH NO. 4: Launching of new caisson for Dry Dock No. 1, Boston Navy Yard, 1901.

Bureau of Construction and Repair wrote:

> The completion and utilization of the new stone dry dock at the navy-yard, Boston, Mass., had during the past year, greatly relieved the difficulties previously existing with respect to docking our large battleships....It still remains a fact, however, that there are on the Atlantic and Gulf coasts only two dry docks in which our largest battleships can be docked....

The legislation of 1898 authorizing the building of the Boston dock and three others had stipulated that they be of "dimensions sufficient to meet the present and probable future requirements of the largest vessels of the Navy...." Shortly after the 750-foot Boston dock was completed, the British launched HMS Dreadnought, which dramatically changed battleship design and led to even larger warships. As originally constructed, Dry Dock No. 2 could not receive North Dakota and Florida, authorized in 1907 and 1908. As evident in the 1906 annual report, the Navy needed more and larger docks.[41]

At least two years before, officers at the Boston Navy Yard had recommended yet a third dock at that installation. The civil engineer argued:

> The location of this yard, surrounded as it is by a large manufacturing population, and the shop facilities now being provided, make the Yard particularly desirable as the site of additional docking facilities....

He advanced the same point as made in recommending the second dock, that no new pumping plant would be required, since the existing plant could handle the new dock. Space simply did not exist for an immense facility, and the civil engineer had in

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41. ARND, 1906 (FSS #5115), p. 546.

mind a dock of 640 feet, to be located between Dry Dock No. 2 and the machine shop complex.[42]

The project never materialized. In 1905, Congress gave approval, but no funds. The proposed third dock continued to receive consideration by the Navy, but early in the second decade of the century, the Commonwealth of Massachusetts undertook the improvement of Boston Harbor. Among proposed projects was the construction of a 1000-foot dry dock on state-owned land in South Boston, two and a half miles from the navy yard. The board inspecting the Boston Navy Yard in 1913 recommended "that the question of constructing another dock at this Yard should be delayed..." and "that the Navy Department make arrangements with the State of Massachusetts whereby the dock could be used by the Navy...." Those recommendations were accepted and implemented. Ultimately, the Commonwealth Dock, completed in 1919, became the property of the Navy and the nucleus of the Boston Navy Yard's annex at South Boston.[43]

In the meantime, Congress met the need for larger docks by authorizing extension of existing docks at New York and Norfolk and the building of two entirely new docks. When that construction terminated, the Navy would have available for docking vessels of the Wyoming class Dry Docks No. 4 at New York, No. 3 at Norfolk, No. 2 at Puget Sound, and No. 1 at Pearl

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42. AREO, 1904.

43. Board to Inspect Navy Yard, Boston, June 2, 1913, 181-39, Box 152, #63.

Harbor.[44]

On the eve of World War I, the Boston Navy Yard was equipped with two docks, the largest of which could receive battleships completed no later than 1910. However, Dry Dock No. 2 was a significant addition and enabled the yard to become a major twentieth-century repair facility.

Other Changes in the Waterfront

The modern Navy required more than dry docks, however important they might be. Another major improvement in the waterfront of the Boston Navy Yard in the first decade and a half of the century consisted of the addition of wharfage. That increase resulted from the development of the Fitchburgh Railroad slip, the construction of Dry Dock No. 2, the establishment of the Harbor Commissioners' line, and the rebuilding and extension of existing piers. However, navy yard wharves received very hard usage and also were vulnerable to deterioration from water and weather. At any given time, usually half of the Boston yard's wharves needed repairs. Moreover, the ever-increasing length of new vessels rendered old wharves unuseable by part of the fleet.

Until the end of the nineteenth century, the yard was woefully lacking in wharf space. Five bona fide piers existed as well as a bulkheaded area known as Wharf No. 3, constituting the eastern side of the approach to Dry Dock No. 1. All of the piers were short, unable to accomodate most warships and some auxiliaries. On September 17, 1898, for example, the captain of

44. ARND, 1910 (FSS #5922), p. 166; Commandant to Commander Andrews, Dec. 24, 1909, 181-39, Box 14, #1511; AREO, 1911.

the yard reported five vessels moored at the yard: Constitution at Wharf No. 6; the yacht Inca at the east side of No. 1; the tug Seminole on the west side of No. 2; the converted ferryboat East Boston on the west side of No. 4; and Vesuvius, the dynamite-gunboat, and Hector, a collier, moored in the stream west of Wharf No. 4. Although Hector was under repair, she was not alongside a wharf.[45]

In March 1899, Congress appropriated $150,000 for the construction of new piers and for extending the old ones to the recently established harbor line. One hundred and twenty-five thousand dollars in additional funds became available in the next five years. Those monies initiated a conspicuous change in the yard's waterfront, and by 1914, the yard possessed nine industrial wharves and a narrow, light usage pier. The increase required a new numbering system, which went into effect in 1900.

The new Wharf No. 1 was built in the general vicinity of the old pier of the same number and of former Wharf No. 2. Its western side faced the Fitchburgh slip. All of the wharves had wooden decks, except for the rebuilt No. 1, made of concrete arches with forty-foot spans supported by concrete piers founded on piles thirty feet below mean water. The rear of the arches was backed with concrete curtains to contain the fill making up the body of the wharf. Because of its size and design, No. 1 was the most expensive pier and took the longest time to complete, about five years. More triangular than rectangular, the wharf

45. Captain of the Yard to Commandant, Sep. 17, 1909, 181-93, Box 49, vol. 60, p. 212.

measured 158 feet at its greatest width. Its western length was 400 feet, and its eastern, facing the approach to Dry Dock No. 1, 372 feet. Like the old Pier No. 1, the new structure was the location of the yard's coaling facilities.

The development of Wharf No. 1 necessitated the moving of Building No. 10, the Construction and Repair paint shop, and the elimination of a small, unused marine railroad, a building slip, and old Wharf No. 2. The Wharf No. 2 built in the early twentieth century partially occupied the site of the former Pier No. 3. It was sixty feet in width and 634 in length along the side facing the approach to Dry Dock No. 1. Wharf No. 2's eastern side was 500 feet long.

The wharves which in 1914 bore the numbers 3, 4, 4-A, 5, and 6 were new structures, located in an area of the waterfront lacking in piers before 1900. Both sixty feet wide, Wharves No. 3 and 4 flanked the approach to Dry Dock No. 2. The newest industrial pier in the yard was Wharf No. 4-A, started in 1911 and completed in 1913. Wharves No. 5 and No. 6, both seventy-feet wide, were finished in 1905 and 1906. The yard's remaining industrial wharves, Nos. 7, 8, and 9, formerly had been numbered 4, 5, and 6. All had been rebuilt and extended to the Harbor Commissioners' line in 1900. Pier No. 10, added to the water-front in 1912 and 1913, provided access to the receiving ship.

In 1914, the Boston Navy Yard had approximately 6,800 feet of berthing space with a depth of thirty feet of water at mean low water. This represented a substantial increment over the meagre wharfage available before 1900 and permitted the yard to

repair more and larger ships. Still, the wharves remained a problem. In March 1913, although none of the piers were more than dozen years old, the Public Works Officer described only the three newest, Nos. 4-A, 9, and 10, as in "good condition." Most of the rest needed new decking, piles, bollards, cap logs, floor stringers, or cross bracing.[46]

Moreover, none of the wharves could berth the full length of the latest battleship. If moored at Wharf No. 5, vessels of the North Dakota class would stretch nearly 200 feet beyond the end of the pier. Since all of the piers extended to the Harbor Commissioners' line, they could not be lengthened seaward without a change in that line. Only in a few instances would it be feasible to extend the slips inward. The one pier more than 450 feet in length was No. 1, which measured 670 feet by 1913, but was generally used for coaling. The War Department opposed the relocation of the harbor lines farther into the channel, owing to the great volume of shipping in the Port of Boston. The harbor was especially crowded in the vicinity of the Navy Yard because of the yard's own piers and the terminal facilities of the nearby Boston and Maine Railroad. All of which perpetuated a shortage of wharfage at the yard.[47]

According to a Navy inspection board in 1913:

> The lack of piers and slips for accomodating vessels constitutes a distinct military weakness of the yard,

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46. Public Works of the Navy (Washington: GPO, 1917), p. 8, 181-39, Box 405 (1917), #6; Public Works Officer to Commandant, Mar. 31, 1913, 181-39, Box 31, #13.

47. AREO, 1911.

particularly in view of the limited future development possibilities.

Nevertheless, the shortage of berthing space did not prevent the yard from performing a large volume of ship work in the early twentieth century and an even greater amount in World War I.[48]

Cranes, Shears, and Rail System

In 1899, the breakdown of a small wooden crane at the dry dock entrance left the Boston Navy Yard without any crane facilities, except the large steel shears, never put into working order, and Construction and Repair's fifty-five-foot scow, not fitted with boom, mast, or winch. The lack of cranes either ashore or afloat seriously handicapped the yard. For example, great difficulty was encountered in handling the anchor and cable when Wabash moved to her new berth. Certainly the yard could provide only limited repair services without the facilities to lift stacks, boilers, heavy guns, turrets, and other components of warships. Changes began in June 1900, when Congress provided funds for the acquisition of a crane scow, a wharf-pillar crane, and a floating derrick. In the meantime, a temporary pair of wooden shears was erected on Wharf No. 6 and makeshift arrangements devised whenever heavy weights had to be hoisted from vessels in dry dock.[49]

By 1914, the yard had nine cranes, but the large steel shears, inherited from the 1890s, were not among them. Procured in 1892, the steel shears, with an original capacity of 100 tons,

48. Board to Inspect Navy Yards, Boston, June 6, 1913.

49. AREO, 1899; ARND, 1899, pp. 872-3.

never became serviceable. Without a third leg, the shears could lift vertically, but could not move weights horizontally. This made them of small practical value. The rearrangement of the waterfront at the west end of the yard required the removal of the shears from their original installation on old Wharf No. 2. After several years, a contract was made in 1904 for remodeling the shears and placing them on the new Wharf No. 1. In the following year, the contract was suspended because of the unsuitability of the location, and alternative plans formed to place the shears on the new Pier No. 6. The legs of the shears were modernized, which reduced their capacity to eighty tons, but Wharf No. 6 needed to be rebuilt before it could be used for heavy weights. Although the civil engineer and construction officer remained committed to the shears and annually sought money for their installation, the decision was reached in 1908 to send them to the navy yard at Portsmouth. The ultimate fate of the shears is unknown, but parts of their equipment subsequently turned up in various corners of the yard.[50]

Meanwhile, the yard had acquired and put into use other weight-lifting apparatus. In addition to the cranes authorized by Congress in 1899, the yard obtained a 40-ton traveling crane. That crane had been proposed in connection with the new dry dock, and the sides and head of the dock had been strengthened to support the additional load. In July 1902, Congress provided

50. ARND, 1901 (FSS #4287), pp. 872-3; ARND, 1902 (FSS #4455), p. 157; ARND, 1904 (FSS #4795), pp. 145-6, 696; ARND, 1905 (FSS #4956), pp. 144, 578; AREO, 1902; AREO, 1906; ARND, 1906 (FSS #5115), p. 575; ARND, 1908 (FSS #5449), p. 499.

$95,000 for the crane and the track. By 1914, if not before, the track extended along both sides and around the head of Dry Dock No. 2, with a spur to a track similarly positioned around Dry Dock No. 1. The crane had a reach which enabled it to lift the maximum load of forty tons from a position five feet beyond the center of the new dock.[51]

Besides the traveling crane, the yard in 1914 had a wharf pillar crane on Pier No. 6 and four locomotive cranes. Hoisting afloat was provided by a 150-ton floating crane, a 20-ton floating derrick, and a 10-ton floating derrick.[52]

At the end of the nineteenth century, the circumstances of the yard's railroad system resembled that of the cranes. It was unserviceable. The old-fashion, flat-type track prevented locomotives from entering the yard. Essentially, a new rail system was required, and Congress made initial funds available in March 1899. In subsequent years, the old track was gradually removed, new seventy-pound rails laid, and locomotives and rolling stock acquired.

The laying of new track proved an unending task. Not only did the old rails have to be replaced, the system had to be extended to new piers and industrial buildings. By June 1914, tracks ran the full length of all wharves, except Nos. 7 and 10. Using the inside rail of the traveling crane, the railroad tracks extended around Dry Dock No. 2. Two spurs led from 1st Avenue to

51. AREO, 1899; AREO, 1900.

52. Monthly Report on Yard Traveling Cranes, Electric and Floating Cranes, Sep. 4, 1914, 181-39, Box 159, #13.

the shipbuilding ways between Buildings Nos. 103 and 104. Tracks entered several of the industrial and storage buildings so as to deliver loads directly under the cranes in those structures. That arrangement also permitted the overnight garaging of locomotives and small locomotive cranes during the winter season. In addition to the four locomotive cranes, the yard's rail system consisted of two locomotives, thirteen dump cars for coal, six flat cars, seven ash cars, four general purpose dump cars, and two general purpose gondolas.[53]

The Building Boom

The years 1900 to 1914 are conspicuous in the history of the Boston Navy Yard because of the construction of new buildings and the extension and improvement of old ones. A few buildings disappeared, owing to accident, decay, or the need for space. Fire destroyed or damaged three buildings. A large conflagration in July 1900 consumed Building No. 85, spar shop, and its entire contents, making a monetary loss of $150,000.[54] In September 1910, most of Building No. 24, then in use as the Construction and Repair offices and rigging loft, was destroyed by fire, leading to its abandonment. One end of Building No. 63 burned in March 1913. A former timber shed, the structure at the time of the blaze stored iron and steel. The surviving part of the building continued to serve that purpose. Prior to the turn

53. Map of the Yard, June 30, 1914, 181-39, Box 194, #6.

54. [Commandant] Sampson to [Bureau of] Construction [and Repair](Telegram), Jul. 20, 1900, 181-16, Box 10, vol. for Feb. 19, 1900-Aug. 3,1900, p. 443.

of the century, fire had damaged the iron platers shop (No. 66), and what remained was razed in 1903 to make room for new construction. Also taken down were the last of the old nineteenth-century shiphouses.

One nineteenth-century structure continued as a major part of the yard's plant. Building No. 42 was both the pride and the sorrow of the Steam Engineering Department. The largest building in the yard and the closest to the waterfront, it contained a number of sizable and expensive machine tools. On the other hand, the structure showed its age. The floor settled, creating conditions one chief engineer described as "chaotic," with huge holes and uneven granite stonework left from the foundations of former machine tools. Parts of the building were so structurally unsound as to make hazardous installation of modern overhead cranes and electric elevators. The roof leaked throughout, contributing to the deterioration of floors. Numerous columns and supports were required to prop up ceilings and roofs, such as in the celebrated crystal palace and the pattern shop. However, they also hindered the installation of large machines and obstructed work in the shops. Some shops, such as the copper and boiler shops, had too little space. Elsewhere partitions had to be erected to isolate one shop from another. Wooden floors in the pattern shop and in other areas posed the threat of fire. The building was unreceptive to the new tools and equipment needed in a modern machine shop and created inefficiency in the operations of the Steam Engineering Department and its successor, the Machinery Division.[55]

Steam Engineering had no choice but to repair and modernize

its plant. That effort encountered obstacles since several appropriations for particular repairs proved inadequate. Moreover, the department needed shops currently in working order because of the increased number of ships arriving at the yard requiring work on machinery. Finally, the administrative instability of the yard led to cancellation of plans and to further rearrangement of shops and machines. For example, in the opening years of the century, Steam Engineering planned to install its own generating equipment, which plans were scrapped with the emergence of a central power plant in the yard. Subsequent consolidations involved the termination of some of the shops in Building No. 42 and the enlargement of others.

Hundreds of thousands of dollars were appropriated in the years 1898 to 1914 for improvements in Building No. 42. The work on Machine Shop No. 1, in the southwest corner of the main building, illustrates the basic approach. Large machines were taken out, and the flooring and old tool foundations removed along with other parts of the interior, leaving only the original walls. Then rebuilding could proceed. That involved new foundations; fireproof floors; structural steel supports for

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55. Information about work on old and new buildings in the yard appears in numerous documents. For Building No. 42, see ARND 1899, p. 185; ARND, 1900, p. 136; ARND, 1901, p. 971; Chap. 852, Mar. 3, 1901, SAL, vol. XXXI, p. 1117; ARND, 1902, pp. 114-5, 157; Public Law No. 234, Jul. 1, 1902, SAL vol. XXXII, p. 672; AREO, 1902; ARND, 1903, p.107; P.L. 160, Mar. 3, 1903, SAL, vol. XXXII, p. 1185; AREO, 1904; ARND, 1904, pp. 145, 857; ARND, 1905, p. 114; AREO, 1906; ARND, 1906, pp. 181-2; ARND, 1907, pp. 736-6; AREO, 1908; ARND, 1909, pp. 472, 677-8; Civil Engineer to Commandant, Apr. 17, 1909, 181-39, Box 11, #2500; P.L. 433, Mar.4, 1913, SAL, vol. XXXVII, p. 899; Public Works Officer, Report of Inspection of Public Works, Mar. 3, 1913, 181-39, Box 131, #13; AREO, 1916, 181-39, Box 283, #13.

ceilings, galleries, and traveling cranes; and a metal roof. Other important changes in Building No. 42 included the substitution of metal trusses for columns to hold up the ceiling of the pattern shop and the installation of overhead cranes in the boiler and copper shops, foundry, and Machine Shop No. 2. The plant's chimney was first repaired and then in 1908 and 1909 was taken down and replaced with a 120-foot stack. In the meantime, machine tools transferred from elsewhere or newly acquired were installed.

Conditions in the building never became satisfactory, and in 1916 an alternative was proposed to the piecemeal approach previously employed. Funds were sought to remove entirely two wings of the building and to erect completely new structures in their place.

Improvements in other structures faced fewer obstacles. During the period, a number of buildings were enlarged. These included No. 40, which contained the rolling mill and anchor forge of the Equipment Department. That department's other metalworking unit, the chain shop, was located across the street in the northern wing of Building No. 42. To accomodate all of these Equipment shops under one roof and to give Steam Engineering more room, Building No. 40 was extended to provide space for chain making. Another Equipment building. the wire rope mill, was made larger by a three-story addition. Non-industrial structures enlarged prior to 1915 included the navy prison (No. 38) and the commandant's office (No. 32).

The building program of the early twentieth century at the Boston Navy yard had features and emphases somewhat lacking

previously in the yard. These included overhead cranes, electric elevators, fire protection, water closets, and sewage removal.

The Progressive Era displayed a deep concern with the saving of time in industrial activities, and the first recommendation for the installation of electric elevators in the Boston Navy Yard was based on that idea. In 1899, the civil engineer noted that

> the second story of Building 42 is at a height of 24′ above the first, requiring in the necessary climbing to and from the offices of the department and the shops, useless expenditures of energy and a waste of time.

Congress made its earliest appropriation for elevators in the yard in March of that year. Thereafter, elevators with capacities between three and five tons were installed in Buildings Nos. 33, 34, 38, and 39, all serving as storehouses. With that beginning, elevators soon were built in the shops and other buildings used for industrial purposes. In some new buildings, such as Nos. 104 and 106, elevators appeared as an afterthought. The paint shop (No. 125) included an elevator in the original design.[56]

A genuine concern with fire protection and fire prevention became evident in the Boston Navy Yard in the years after 1898. This was altogether appropriate in a major military and industrial establishment. A navy yard simply could not tolerate the disruption of its activities which major fires caused. Cost consciousness produced a recognition of the expense of fire insurance, which would be lessened by proper precautions. The chances of confining a blaze to one structure decreased as the

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56. AREO, 1899.

yard became more congested. Several fires during the period, especially those in buildings Nos. 24 and 63, highlighted the problem.[57]

In 1900, the Boston Navy Yard had no effective apparatus of its own for fighting fires. A portable pump was rarely used except to pump out cisterns. The yard had three fire signal boxes.[58] Reliance then and in 1914 was placed on the municipal fire department, about which the yard officers had no complaints. That fire department maintained a station house in Charlestown and only a few blocks from the yard. What was required at the yard was a system to alert the fire department as quickly as possible; the employment of fireproofing techniques in construction and improving buildings; insuring an adequate water supply for fire fighting; an effective watchman system at night and other nonworking hours; and the distribution of workable extinguishers and hoses to cope with small fires.

Of the forty structures erected in the Boston Navy Yard in 1899-1914, only eleven were not constructed largely of brick, steel, iron, or concrete. Some of the eleven were temporary buildings, such as the electric light plant (No. 95), or small structures, like the nine-by-five-foot guard house (No. 116), the Marine Corps rifle range (No. 122), and the scale house (No. 128). Many of the new industrial buildings contained fireproof floors and walls. Automatic sprinklers appeared in old

57. For an informative discussion by the yard's civil engineer respecting fires, see AREO, 1916.

58. AREO, 1899.

buildings, for example the ropewalk (No. 58), tarring house (No. 60), and hemp house (No. 62). In 1899, the civil engineer recommended discarding the few, heavy, old-style portable fire extinguishers of questionable reliability and placing small chemical fire extinguishers in every building, floor, and shop of the yard. That recommendation was not completely implemented, but large numbers of new extinguishers did appear thereafter. Other new fire-fighting apparatus included hydrants in the streets and outlets, valves, racks, and hoses in buildings. The distribution of forty telephones around the yard aided in sounding the alarm should a fire break out. To insure a phone connection with the municipal fire department, the line from the switchboard in Building No. 31 was carried in an underground conduit to a point outside of the yard.[59]

The Navy inspection board in 1913 reported "most of the buildings have sprinkling systems, fire extinguishers and apparatus for immediate aid in extinguishing fires." The board recommended installation of sprinklers in the sawmill (No. 114), pattern shop (in No. 42), south end of the hemp house (No. 62), and the storehouses and storerooms in the custody of the general storekeeper. Consistent with these proposals, further improvements were made in fire protection.[60]

Capt. William Rush, who became commandant in 1914, seemed especially concerned with fire protection and fire readiness. In

59. AREO, 1899.

60. Board of Inspection on Navy Yard, Boston, Jun. 2, 1913, 181-39, Box 152, #6.

1915, he issued yard regulations requiring the preparation and posting of a "Fire Bill" in each building. That document contained instructions and procedures to be followed in the event of fire, a list of fire assignments for the building's personnel, and a sketch showing the location of extinguishers, hoses, and fire plugs. Another innovation was the filing by shop foremen of a "Monthly Fire Report," consisting of answers to twenty-six questions on the readiness of fire-fighting equipment in the shops. Fire drills in buildings and on Constitution became common. Rush pressed for the completion of fireproofing the pattern shop in Building No. 42. "Strict orders" were issued on the carrying of matches and oil lanterns in the yard, and additional fire alarm stations were installed. None of these precautions came in time to save Building No. 64, a former timber storage shed used as a storehouse, which was destroyed by fire in 1916.[61]

Between 1899 and 1914, forty new buildings appeared in the Boston Navy Yard. Compared with other periods, this constituted something of a building boom. Five of the new industrial buildings were shops for the Construction and Repair Department: a new shipfitters shop (No. 104); metal workers shop (No. 106); sawmill and spar shop (No. 114); paint shop (No. 125); and a combination smithery and departmental power plant (No. 105). Except for the sawmill, the buildings were located near the

61. For the yard fire bill regulation and examples of such a bill and of the monthly shop report, see 181-39, Box 212 (1915), #117; Commandant to Bureau of Yards and Docks, May 29, 1915, 181-39, Box 256, #6; AREO 1916.

waterfront. The shipfitters shop stood as the central Construction and Repair facility in a complex that also included the smithery-power plant and the metal workers shop. In June 1900, Congress authorized the construction of the three buildings, each to cost no more than $200,000. The same contractor, J. L. Leach, erected all of them.[62]

The new shipfitters shop was constructed on a site partially occupied by the old sawmill (No. 67) and near the former shipfitting building which it replaced. That replacement became necessary because in the late 1890s, a shipfitting complex had grown haphazardly, consisting of temporary wooden buildings and extensions, which collectively constituted a serious fire risk. Indeed, in 1899, a fire severely damaged the main structure and the east wing of the nearby iron plate shop (No. 66). The new shipfitters shop, a two-story building completed in 1905, had a rectangular design, 450 by 110 feet, and stretched between 1st Avenue and Wharf No. 7. The structure contained two five-ton traveling cranes, a gallery for wireworkers, and an electricians' workshop.

The shipsmiths shop and power plant (No. 105) was built on the north side of 1st Avenue and across the street from the shipfitters shop. Following the fire of 1899, the iron plate shop had been repaired, but later was removed to make room for the smithery and power plant. Consistent with the autonomy then enjoyed by the bureaus, the Boston Construction and Repair

62. Information on new buildings in contained in ARND and AREO for the years 1899-1914.

Department had authority to generate its own electricity. The power plant was located in the west end of Building No. 105. That two-story structure, built of brick and steel, was 329 feet in length and 100 in width. During construction, tools were installed as floor space became available. Those tools included forge equipment and oil-fired furnaces. The shop, completed in 1907, contained an overhead crane.

Building No. 106, the metal workers shop, was the third entity in the Construction and Repair complex, and occupied a previously vacant site on the north side of 1st Avenue and immediately east of the smithery. Of the three buildings in the complex, the metal workers shop was completed first, in January 1904. Identical in basic design, dimensions, and construction materials to the smithery, the metal workers shop was intended to provide a place for Construction and Repair functions not housed elsewhere. These included such activities as metal furniture making, galvanizing, nickel-plating, and copper smithing. The shop contained a machine shop, galvanizing plant, and erecting floor. Subsequently, parts of No. 106 served as a shop and storage area for the Ordnance Department, an electrical repair shop, and a shipfitters storehouse. By 1914, Buildings Nos. 104, 105, and 106 were linked together by craneways and the yard's rail system.

A serious fire during the night of July 18 and 19, 1900, consumed the spar shop and boat shop (No. 85) and its content, consisting of $116,000 worth of spars, new boats, boats under repair, and material. At that time, the sawmill was housed in

Building No. 67, a weak and ancient wooden structure, scheduled for removal. To replace the old sawmill and the destroyed spar shed, a new structure (No. 114) was built on the site of the former spar shed, using funds voted by Congress in March 1901. The contractor began work in April 1902 and finished in May 1908. The building, which cost nearly $200,000, was 375 feet long and 150 feet wide in the northern third of its length and ninety-five in the remainder. The lower of its two stories housed the sawmill and spar shed, the large circular saw being installed in the western section. The second floor had no interior walls or obstructions, so that it could be used as a mold loft. As a result of the consolidation of departments in 1909, Construction and Repair shipwrights relocated from Building No. 24 to Building No. 114.

In 1900, the building of the Fitchburgh slip forced the Construction and Repair paint shop (Building No. 10) out of commission, since dredging undermined the shop's foundation. The railroad company made available temporary quarters for the painters. Eventually, Building No. 10 found a new home on the east side of Wharf No. 1. However, it no longer served as a paint shop. Its limited size would have required continuation of preparation of paints by hand, and the building was too small for modern paint-mixing machines already contracted for. In March 1903, Congress provided $35,000 for a new paint shop, a two-story, 113 foot by 156 foot brick structure. It was located between the two dry docks to facilitate the painting of hulls, the shop's chief activity. The new shop, designated Building No. 125, was finished and turned over to the Construction and Repair

Department in 1907.

The Construction and Repair Department occupied five of the eleven permanent industrial buildings constructed during the period. One of the other six was the new pumping plant (Building No. 123) of the second dry dock. The remaining five new buildings consisted of the ropewalk power house (No. 96), a chain and anchor storage facility (No. 103), and a coal pocket (No. 107), all initially belonging to the Equipment Department; and a shop building (No. 107) and power plant (No. 108), both assigned to the Department of Yards and Docks.

At the end of the nineteenth century, the Boston Navy Yard lacked facilities for the coaling of large warships. Prior to the Spanish-American War, the Navy relied on private contractors, not navy yards, to provide coal for ships. The early stages of the war proved that arrangement deficient, and a board of naval officers recommended proper facilities at each navy yard. Previously, naval vessels burned hard coal, which did not suffer from lying in piles open to the weather. The shift to soft coal created problems respecting storage, since that coal was damaged when left in the open.[63]

Two wooden coal sheds on old Wharf No. 1 constituted the Boston yard's coaling plant in 1898. At that time, the pier was unsafe for use, and the coal run was removed to Wharf No. 2. As recommended by the Navy Coal Board, funds were sought from Congress for a coaling plant capable of storing 15,000 tons. In March 1899, the legislature appropriated $130,000 for that

63. New York Times, June 10, 1898, p. 3.

purpose. Since the new structure would occupy the same general site as the old sheds, delay ensued because of the development of the Fitchburgh slip and the construction of the new Wharf No. 1. The Navy awarded the contract to August Smith of New York in July 1901 for construction of a facility with a capacity of 11,400 tons.

The finished plant, built of concrete and corrugated iron, measured 420 feet in length and seventy-five in width. It included a steel tower, which housed the mechanized hoists. Completed in 1904, the plant suffered damage from a storm on September 30 of that year. While undergoing repairs, the plant was somewhat enlarged. To assist in the coaling of vessels at the yard, the Construction and Repair Department built six barges. By 1916, the plant had a capacity to store 12,500 tons of bituminous coal. However, the Boston Navy Yard was not well situated geographically for supplying fuel to the fleet because of the difficult channel leading to the sea and the restricted anchorage. The Bureau of Equipment, starting in May 1902, sought a location in the lower parts of Boston Harbor for a coal depot with a capacity of not less than 50,000 tons.[64]

Plant improvement at the Boston Navy Yard in the years 1900 to 1914 included provision for the electricity, steam power, heat, and compressed air required by the yard's buildings and facilities. It took approximately fifteen years for a modern electric generating system and power plant to evolve at the yard. The initial lighting plant, installed in half of the lower floor

64. AREO, 1899; ARND, 1902, p. 353; ARND, 1903, p. 353.

of Building No. 28, utilized steam produced by the boilers in the old dry dock pumping plant, Building No. 22. By 1897, the electric light plant had its own boilers. Because of the increase in actual and projected demand for power, both for lighting and driving machinery, an enlarged temporary plant was assembled in a building near the machine shop. That plant began producing power in 1900 and ultimately took over the load from the plant in Building No. 28. In the meantime, lines and conduits were being installed to provide electricity for yard buildings, residences, and shops and to ships in the yard for repair. Other power plants came into being to furnish power to particular departments and facilities. In 1899, a $15,000 plant was completed in Building No. 96 to provide electricity to the ropewalk and wire rope mill.[65] The Equipment plant was later connected with the rolling mill, forge shop, and chain shop. Construction and Repair was having its own boilers and generators installed in the new smithery. In 1906, work was completed on Building No. 134, a power station for Wabash.

A single power plant for the yard had its genesis in a congressional appropriation in 1899 for a Yards and Docks generating facility. In 1904, that plant was completed (Building No. 108). In the same year, Congress stipulated that at all navy yards, the production of power and heat was to be consolidated in one plant run by the Bureau of Yards and Docks. In the Boston yard, this led to the enlargement of Building No. 108 by means of

65. ARND, 1902, p. 301.

an extension and the addition of an economizer house, to enable the facility to produce all of the yard's electricity, steam, compressed air, and heat. That enlargement and the rearrangement of cables resulted in the shutting down of other plants, including the temporary one in Building No. 95, the Construction and Repair plant in Building No. 105, and the Equipment plant in No. 96. The capacity of the central plant grew with the installation of additional boilers, generators, compressors, and other equipment, either acquired anew or transferred from the closed stations. By 1916, the central power plant could generate 3,750 kilowatts of electricity and could produce 9,700 cubic feet of compressed air per minute.

Until 1904, the Yards and Docks Department had no building of its own for shops and offices, but was a tenant in several structures under the control of other departments. A tenant could be moved when the host required additional space. Yards and Docks thus sought its own building and, when funds became available in 1900, selected a site immediately south of the ropewalk. That location, midway between the east and west ends of the yard, but far removed from the waterfront, was attractive since it provided ready access to the various parts of the yard and, hopefully, would avoid a future takeover by one of the departments involved in work on ships. Erected at a cost of $205,000, Building No. 107 was a 200-foot by sixty-foot brick structure. Funds ran out before the floor of the third story could be laid, and loose boards were placed across the steel work for the storage of materials. In 1907, Yards and Docks

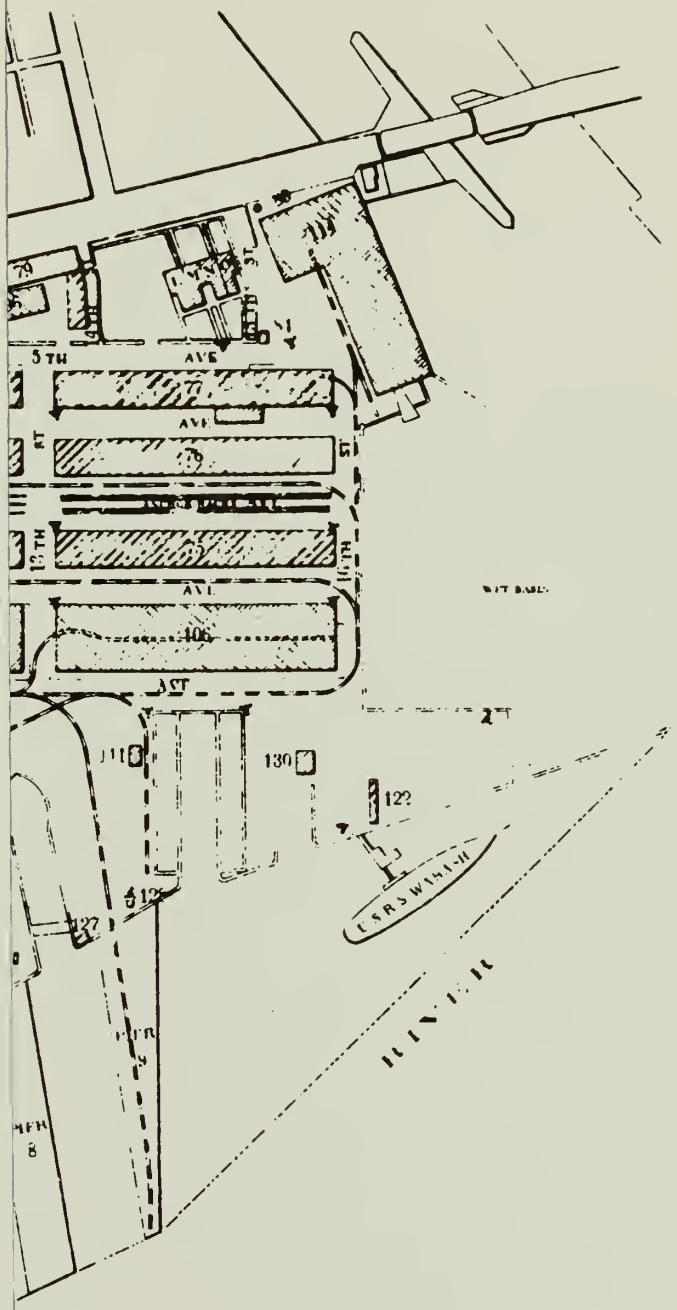
CHART NO. 2: THE UNITED STATES NAVY YARD, BOSTON, MASS.; MAP OF YARD SHOWING IMPROVEMENTS TO JUNE 30, 1906, ACCOMPANYING ANNUAL REPORT OF OPERATIONS (YARDS & DOCKS) FOR FISCAL YEAR 1906.

LIST OF BUILDINGS

Qtrs. A, Mail Messenger
Qtrs. B, Equipment Officer
Qtrs. C, Naval Constructor
Qtrs. D, Asst Equipment Off.
Qtrs. E, Steam Engin. Off.
Qtrs. F, GSK
Qtrs. G, Commandant
Qtrs. H, CO, Marine Corps
Qtrs. I, Marine Barracks
Qtrs. K, Marine Officers
Qtrs. L, Captain of Yard
Qtrs. M, Civil Engineer
Qtrs. N, Ordnance Officer
Qtrs. O, Surgeon

No. 1, Masons Shed
No. 4, Storehouse
No. 5, Pay Office, Labor Bd, Capt. of Watch, Museum
No. 10, (Old) Paint Shop
No. 16, C&R Foundry
No. 19, Scale House
No. 20, (Barn)
No. 22, C&R Machine Shop, Pump House for DD No. 1
No. 23, Lunch Room
No. 24, C&R Offices
No. 28, Old Electric Light Stat
No. 31, Captain of Yard; Board of Inspection
No. 32, Commandant's Office
No. 33, Storehouse, Sail Loft
No. 34, Storehouse
No. 36, Joiner Shop
No. 38, GSK Offices; Prison
No. 39, Equip. Offices, Machine Shop; Ordnance Offices, Shops
No. 40, Equip. Rolling Mill, Anchor Shop
No. 42, S.E. Offices, Foundry, Machine Shop, Boiler Shop, Forge
No. 43, Boiler House
No. 44, Y&D Inspectors
No. 48, Magazine
No. 58, Ropewalk
No. 60, Tarring House
No. 62, Hemp House
No. 63, Timber Shed
No. 64, Timber Shed
No. 75, Timber Shed, Spar Shop
No. 76, Timber Shed
No. 77 Boat Shop, Boiler & Engine House
No. 78, Coal Shed (Equip)
No. 79, Wire Rope Mill
No. 84, Marine Guardhouse
No. 94, Carpenter Shop
No. 95, Electric Light Station
No. 96, Ropewalk Power-house
No. 101, Timber Kiln
No. 103, Chain & Anchor Storage
No. 104, Shipfitters Shop
No. 105, C&R Smithery
No. 106, Metal Workers Shop
No. 107, Y&D Offices, Work Shops
No. 108, Power & Light Plant
No. 109, Coaling Plant
No. 110, Pitch House
No. 113, Storehouse
No. 114, Sawmill & Spar Shed
No. 117, Stable
No. 118, Water Closets
No. 119, Water Closets
No. 120, Dispensary
No. 122, Rifle Range
No. 123, Dry Dock Pump House
No. 124, Latrine
No. 125, (New) Paint Shop
No. 126, Latrine
No. 127, Latrine
No. 128, Scale House
No. 129, Wireless Station
No. 130, Stores

NOTE: Major changes since 1890s, as revealed by a comparison of Chart No. 1 and Chart No. 2, include construction of Dry Dock No. 2; new and rebuilt piers; elimination of the shiphouses; and the erection of numerous new industrial buildings, particularly No.103 (Chain and Anchor Storage), No. 104 (Shipfitters Shop), No. 105 (C&R Smithery and Powerhouse), No. 106 (Metal Workers Shop), No. 108 (the future Central Power Plant), No. 114 (Sawmill and Spar Shop), No. 123 (Pump House for both Dry Docks), and No. 125 (Paint Shop).



The United States Navy Yard.

BOSTON, MASS.

MAP OF THE YARD SHOWING

IMPROVEMENTS TO JUNE 30 1906.

ACCOMPANYING ANNUAL REPORT OF OPERATIONS FOR FISCAL YEAR 1906

Respectfully submitted,

Civil Engineer, U. S. N.

CHARLESTOWN

CHELSEA ST

CHARLES RIVER

MYSTIC RIVER

HARBOR COMMISSION LINE

The United States Navy Yard.

BOSTON, MASS.

MAP OF THE YARD SHOWING

IMPROVEMENTS TO JUNE 30 1906.

ACCOMPANYING ANNUAL REPORT OF OPERATIONS FOR FISCAL YEAR 1906

Respectfully submitted,

Civil Engineer, U. S. N.

obtained additional funds for a proper floor in the third story.[66]

Yards and Docks had only brief use of Building No. 107. The consolidation of shops in 1909 saw the transfer of that department's machine shop to Building No. 42 and its woodworking equipment to the Construction and Repair spar shop. Building No. 107 was taken over by the general storekeeper.[67]

The Department of Equipment succeeded in 1901 in obtaining funds for a building to store finished chains and anchors. Lacking such space, the department had been forced to store anchors in the open and to place completed chain in an old shiphouse, thus risking damage by fire. Handling, cleaning, and repainting articles so stored constituted an unnecessary expense. The new chain and anchor storehouse, Building No. 103, was located between 1st Avenue and the waterfront, close to the chain and anchor shop in the recently enlarged Building No. 40. It possessed the same general features as other new industrial structures in that area of the yard, being made of brick and steel and having a rectangular floor plan, 450 by sixty feet. Settling of the foundation at the waterfront end delayed completion until late 1904. Subsequently, a fifty by 200-foot steel and corrugated iron extension was added to the east side of Building No. 103. Within a few years, the building also housed the Equipment electrical shop and rigging loft. Following consolidation of departments in 1909, the second floor became the

66. AREO, 1899; AREO, 1906; AREO, 1908.

67. ARND, 1909, p. 473.

consolidated electrical shop.

Among the new buildings erected in the early twentieth century and not used for industrial activity were: a handsome gate and entrance house, Building No. 97, at the juncture of Wapping and Water Streets; a two-story dispensary (No. 120), south of the western end of the ropewalk; No. 136, an administration building for the Marine Corps, on the southwest corner of the parade ground; and Quarters "P," a residence for the assistant naval constructor, separate from, but near the other units of the lower quarters.

The expansion of the Boston Navy Yard's plant during the years 1900 to 1914 exceeded that of any subsequent peacetime period. The new dry dock and industrial buildings would soon be extensively used. Military establishments prepare themselves for times of war, and during the first fifteen years of the twentieth century, without recognizing the particulars, the Boston yard was gearing its plant for World War I.

THE YARD'S ENLARGED WORK FORCE

As evident in the tremendous volume of ship work performed by the Boston Navy Yard during both world wars, the capability of the yard's plant greatly exceeded the size of the peacetime labor force. During the decade and a half after the Spanish-American War, the Boston yard generally maintained a labor force of slightly more than 2000 employees. That force was of a size sufficient to utilize roughly only one-quarter of the facility's

68. ARND, 1900, p. 270; AREO, 1906; ARND, 1909, p. 472.

physical capacity. This was true even though the number of workers greatly exceeded the several hundred men employed during most of the 1890s. The labor force in the period 1900 to 1914 differed from that of the "old," nineteenth-century yard not only in size, but in the greater heterogeneity of the workers' backgrounds and skills and the increased readiness of employees to seek resolution of grievances through organized and collective means.

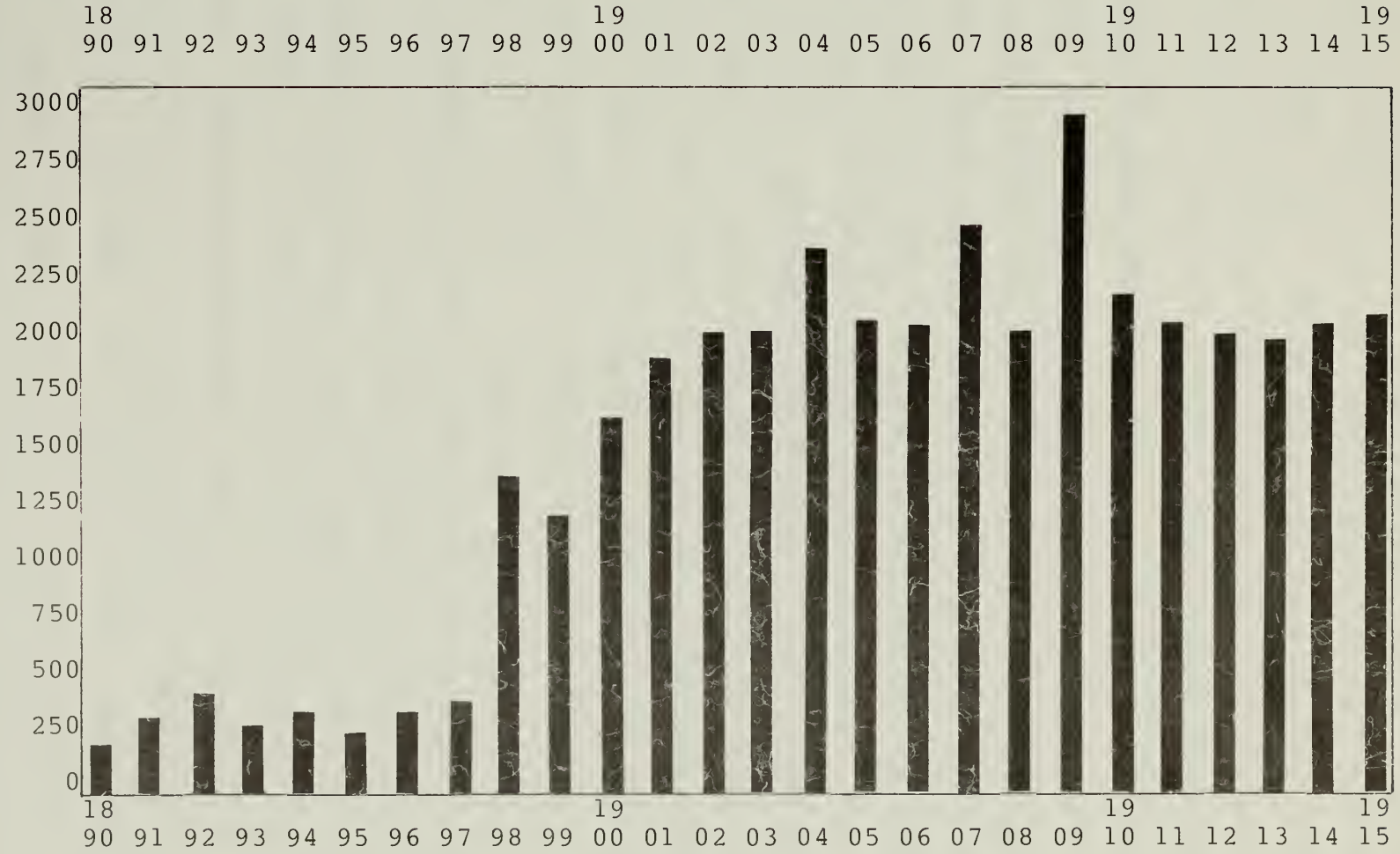
Hiring Procedures

In the period between the Spanish-American War and World War I, the Navy retained the system introduced in the 1890s for the hiring of navy yard employees. Some changes occurred, and regulations became more complex, but all alterations conformed to the basic emphasis on merit. In December 1912, President Taft declared that "all artisans and supervising artisan positions ...are hereby included in the competitive classified service of the United States...." Since existing regulations covered most supervisors, the order had importance mainly respecting the hiring of mechanics, the largest single group employed in the yards.[69]

Previously, men who met the requirement of citizenship and produced certificates or other evidence of experience and competency in a trade could be placed on a yard labor board's registry for that trade. The chronological order in which men

69. U.S. Civil Service Commission, Regulations Governing Appointments to Navy-Yard Service (Washington: GPO, 1915), p. 30. A copy of this volume is in 181-39, Box 288 (1916), #154. Taft's announcement is reported in New York Times, Dec. 8, 1912, p. 13.

Table No. 3: NUMBER, CIVILIAN EMPLOYEES ON JUNE 30, BOSTON NAVY YARD, 1890-1915



(SOURCE: Yard Log, 181-58)

submitted applications determined their position on the list, with preference assigned to veterans and furloughed workers. As demonstrated at the Boston Navy Yard during the war with Spain, that system occasionally resulted in the employment of men lacking in ability. The president's order reduced the likelihood of the unqualified being hired.

By June 30, 1913, the registration lists formerly used were replaced with lists in which the names of eligibles did not appear in the order in which they had applied, but according to a score resulting from an examination or evaluation made by the Labor Board of the candidates' papers. The new regulations required that "examination papers should be rated on a scale of 100." Those applicants "rated at 70 or more shall be eligible for appointment, and the names shall be placed on the proper register according to their percentage ratings." The examination papers referred to were the documents testifying to the applicant's knowledge and experience, his character, and his physical ability to perform the work required of his trade. Although not foolproof, the system did shift the ordering of the list from first-come first-served to ability.[70]

Applicants for positions other than laborer (Group I) received ratings for physical condition and for training and experience. Procedures required submission of a Civil Service medical form executed by a licensed physician. If of the proper weight-height ratio, men at least five feet, six inches tall received a percentage of ninety-eight, and those of lower height,

70. Regulations Governing Appointments to the Navy-Yard Service, p. 13.

ninety-five. From that figure, deductions were made for physical defects and health problems. The final rating for health and physique counted less, by a ratio of four to six, than the rating for training and experience. Applicants for positions as mechanics received 100 points for seven years experience as a journeyman, seventy-three for one year. Those seeking employment as laborers were evaluated solely on the basis of their health, physique, and ability "to lift, shoulder and easily carry a mail sack and contents weighing 125 pounds." To obtain the highest rating, ninety-eight points, a candidate was required to be in "such general condition that there is reasonable prospects of his being useful to the government for twenty years."[71]

By 1915, employment regulations for navy yards included age qualifications. Positions as "boys" were limited to young men between fourteen and eighteen, unless in conflict with the laws of the state. In such a conflict, the state laws prevailed. For all other positions in Group I, applicants had to be seventeen years of age or older. With a few exceptions, seventeen was also the minimum age for helpers (Group II) and mechanics (Group III). Age regulations for other positions (Group IV) were cited in the announcements of examinations for those positions.

Except in the case of disabled veterans, all applicants rated at seventy or more were placed on a general registry list, one for each trade or type of position. The lists, prepared quarterly, contained the eligibles' name, percentage ratings,

71. United States Civil Service Commission, Instructions to Labor Board, 1913, 181-39, Box 172 (1914), #154.

relative standings, and the lowest wage rates they would accept. Eligibles honorably discharged from military service were to receive preference over others with the same percentage rating.

Besides the "general lists" of eligibles, a labor board maintained several preferred registries. One consisted of navy yard employees who had been furloughed for lack of work or funds and who were deemed worthy of being rehired. A second preferred list was comprised of the names of disabled veterans who had received scores of sixty-five or better. Piecework was introduced into the Boston yard for certain trades in 1914, and regulations required lists of eligibles registering for work of that type.

In filling requisitions from yard departments, labor boards initially turned to the furlough list, starting with the first name and proceeding as far as necessary. When that list became exhausted, the preferred list of disabled veterans was used and then the general registry.

A labor board was directly involved in the hiring of men for occupations in Groups I, II, and III. It did not play the same role respecting three other categories of classified employees. Group IV(a) consisted of supervisory artisans, namely foremen, master mechanics, tugmasters, leadingmen-in-charge, quartermen-in-charge, leadingmen, and quartermen. "Special employees" made up Group IV(b). These were workers "whose primary qualification is a trade-knowledge, but who are not required to possess more than a limited educational qualification." This category included positions of progressmen, shop stores supervisors, and special mechanics. Group IV(c) employees, required to have

educational and technical qualifications, filled a range of positions from clerks, bookkeepers, telephone operators, and stenographers to chemists, draftsmen, mechanical engineers, and powder experts.

Positions in Groups IV(a) and IV(b) were "filled by certification by the district secretary under the `district system.'" Essentially, yard officers prepared and administered competitive examinations and notified the local Civil Service authorities of their recommendations. Appointment to Group IV(c) positions of a clerical nature was through examinations given by the Civil Service Commission. Draftsmen, technicians, engineers, and the like received appointment from the Secretary of the Navy, again based on competitive examinations.

All workers hired through the labor boards, that is those in Groups I, II, and III, and some of those in Group IV appointed by the Secretary of the Navy, were on a per diem wage basis and assigned a daily rate of pay. The remainder received an annual salary.

Originally, yard labor boards included three commissioned officers. Regulations issued in 1915 required boards made up of:

> one commissioned officer with a rank not lower than that of lieutenant commander, who shall serve as senior member of the board, three employees permanently assigned to the yard...and the district secretary of the Civil Service Commission.

In addition to the five members, labor boards had staffs, consisting of a recorder, physician, clerks, and other support personnel.

The 1915 regulations described several classifications of

civilian employees. "Unclassified" or Group I workers were those engaged in manual tasks requiring "no skill or trade knowledge," such as coal handlers, common laborers, and teamsters. All other groups were "classified." Group II included "apprentices, helpers and others engaged upon work which requires some mechanical skill or trade knowledge," such as cupola men, oakum spinners, rivet heaters, and weighers. Helpers, the most numerous Group II workers in the Boston yard, were men with skill levels between those of a laborer and a mechanic. "A helper is supposed to be a man of sufficient intelligence and manual skill" to do some of the rough work in his trade and who had acquaintance with the tools employed and a familiarity with the object or material being worked on. A mechanic was a man who had passed through a regular apprenticeship or had the equivalent of apprenticeship because of experience in shops in "work of increasing difficulty." Helpers did not provide manual assistance alone, such as lifting or carrying. That type of work was performed by laborers.

The vast majority of manual workers were in Group III. Navy regulations in 1915 listed almost 150 different skills or crafts. The Boston yard actually employed only half of those ratings, and the wage schedule for 1914 listed seventy-four job categories in Group III[72]

Once or twice each year, competitive examinations were held for leadingmen and quartermen. The examinations were open only to employees who had worked at the navy yard for six months at

72. Schedule of Wages for the Year 1914, 181-39, Box 173, #158.

the trade for which the examination was being held. This meant that appointment as a leadingman or quarterman was in the nature of a promotion. Based on the examination results, the labor board maintained a list of eligible leadingmen and quartermen. A department requiring such a supervisor used a requisition on the labor board, which notified the department of the men with the three highest ratings. If the department selected an individual with the highest rating, the approval of the commandant finalized the appointment. If one of the other two on the list was selected by the department head, an explanation was required, which the labor board forwarded to the Secretary of the Navy for his approval.

To recapitulate, several methods existed for the hiring of navy yard personnel. The labor board examined candidates for Groups I, II, and III positions, placing their names on registers according to the scores achieved in the examination process. Competitive examinations, as created and administered by the Navy or the district Civil Service Commission, were used for Group IV positions.

Although the requirement of competitive examinations for skilled workers became more widely employed, the use of such procedures had been routine at the Boston Navy Yard for certain kinds of positions since the beginning of the century. For example, in 1901, the Department of Construction and Repair required a special mechanic "skilled in pneumatic appliances" for its growing shipfitters shop. The Navy Department gave its approval, and Secretary Long on November 6, 1901, issued Navy Yard Order No. 262, announcing the position, establishing the

wage ($4.00 per day), and inviting qualified persons to apply to the commandant before November 25. Applications were to be accompanied by evidence of citizenship and affidavits from previous employers as to character, habits, and ability. Copies of the order were sent to the yard for distribution to interested parties, and advertisements were placed in two Boston newspapers. As required by the order, Commandant William T. Sampson appointed the yard's naval constructor, assistant naval constructor, and a chief carpenter as the board of examiners and directed them to convene at the Naval Lyceum in Building No. 5 on November 26.[73]

The board prepared ten questions for the written part of the examination and four for the oral section. To the layman, the examination appears thorough and demanding. Question No. 3 in the written section read:

> Name and describe the different types and varieties of air tools in use. State the main points of differences in the tools of three principal manufacturers. Sketch and describe briefly a pneumatic hammer and state the name of the hammer sketched.

The board met and examined the applications and papers of seven candidates, all of whom had submitted proper proofs and certificates. The seven men were notified to report for the examination on December 4 at 9:00 a.m. Six of the applicants appeared at that time, and one withdrew thirty minutes after the written examination began. The oral part was held the following day.

Using a numerical system, the board scored the candidates with respect to character (10%), age and physique (20%), experi-

73. Documents on this examination are in 181-123.

ence (20%), written examination (25%), and oral examination (25%). Edmund Hoxie's score of ninety-three placed him clearly above all of the others. The board, accordingly, recommended him and forwarded to the commandant the Secretary's order, all correspondence, applications, examination questions, the applicants' answers, and other papers.

The procedures for filling positions of quartermen and leadingmen differed from those for special mechanics. Leadingmen and quartermen came from the ranks of mechanics already employed at the yard, and the examinations were given annually or semi-annually, not when an opening appeared. The objective was to maintain a list of men eligible for appointment, so that a vacancy could be filled quickly. A three-man board of examiners, in this instance, included master mechanics as well as officers. Candidates were examined in writing and orally, but more weight was given to experience than performance on the examinations.[74]

In similar fashion, registers were maintained of men qualified for technical jobs in the yard. An examination was given in November 1909 for positions of electrical draftsman and mechanical draftsman in the new Manufacturing Department. The order initiating the examination procedure contained the standard statement: "The exam will be open to all comers who can give evidence of experience in the kind of work for which they seek employment and who are citizens of the United States." This particular examination demonstrated that candidates who could

74. For report of an examination for leadingman driller, see Board to Commandant, Jan. 25, 1909, 181-39, Box 8, #2406-1.

provide "evidence of experience" might not achieve impressive scores. One of the problems presented to those seeking the appointment as mechanical draftsman contained the instructions: "Make a diagramatic sketch, showing steam engineering arrangements of a battleship with at least three steering positions." Seven men took the test for electrical draftsman and thirteen for mechanical draftsman. Of the twenty candidates, only one qualified, earning 701 out of a possible 1000 points. The other nineteen scored 333 points or less. Not only did all but one perform poorly on the examination, they also received low marks for experience. This suggests the yard followed a liberal policy in deciding who was qualified to take the examination. In this instance, the board recommended C. E. Steinriche, who had the 701 points, for the rating of electrical draftsman second class.[75]

There seems little doubt that, following the introduction of Civil Service procedures, many of the employees in supervisory and technical positions at the Boston Navy Yard were experts in their callings. Their standing and their experience in the yard equipped them with the qualifications in demand by private shipyards. Such a case appeared in 1900, when Alexander Mason, "leading outside shipfitter in the construction department," resigned to take charge of operations at George Lawley and Sons of South Boston, then building two torpedo boats for the Navy. Prior to his departure, Mason received a gold watch, chain, and

75. Report of Board to Commandant, Dec. 27, 1909, 181-39, Box 6, #2405-1.

diamond charm from master mechanics, foremen, and employees.[76]

Hours, Holidays, Wages, "Benefits."

During the period before World War I, an eight-hour day prevailed at the Boston Navy Yard for manual workers, except in the months of July, August, and September, when Saturdays were half-holidays. A democratic system was sometimes used to establish when the work day began and ended, and workers themselves voted on the matter. For example, as of April 5, 1915, working hours were from 8:00 a.m. to noon and 1:00 p.m. to 5:00. During the noon muster of October 15, 1915, ballots were distributed to employees to be marked, signed, and returned at the morning muster of the following day. As a result of the voting, morning work hours remained the same, but lunchtime was shortened,[77] and afternoon hours were from 12:30 p.m. to 4:30. White-collar employees worked seven hours a day, reporting at 9:00 a.m., not 8:00.

The Boston Navy Yard, as did other government offices and establishments, observed national holidays by suspending work and, on patriotic occasions, by military ceremony. For each of these days, the commandant issued a written order, sent to department heads and posted in the yard. On Washington's Birthday, Memorial Day, and Independence Day, the yard's flags were displayed, as required by Navy regulations, and at noon a

76. Article in unknown newspaper, Jun. 1900, 181-83.

77. Yard Order No. 308, Mar. 15, 1915, 181-39, #159; Special Order No. 7, Sep. 17, 1915, Box 212, #11711; General Notice No. 85, Oct. 14, 1915, 181-39, Box 212, #1174.

salute was fired from the yard battery located, near Pier No. 4. Other holidays were Labor Day, Thanksgiving Day, Christmas, and New Year's Day. The Boston yard also suspended work on Massachusetts state holidays, namely Patriots' Day (April 19) and Bunker Hill Day (June 17). In addition, government establishments suspended work on the death of national leaders, such as that of Vice President James S. Sherman, who died in November 1912.[78]

When a national holiday fell on a Sunday, government activities were closed the following Monday. Navy policy permitted use of leaves of absence by employees desiring to observe holidays which did not occasion suspension of work. For example, in 1915, at the request of Temple Mishkan Tefila in Roxbury, the commandant and department heads directed foremen to grant leaves of absence to Jewish employees for the Day of Atonement, September 18.[79]

All per diem workers received credit for eight hours on legal holidays and for the Saturday half-holidays in the summer. They received no wages for days on which work was suspended because of bad weather or because machinery was out of order.

Between 1900 and 1914, no major changes occurred in the method of fixing wages of the workers at the Boston Navy Yard. Continued was the basic formula whereby a board of yard officers recommended wages for the several classes of laborers, helpers,

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78. For the commandant's holiday orders for the year 1909, see General Order, Feb. 15; Order, Apr. 13; Order, May 24; General Order, Jun. 10; Order, Jun. 18; Order, Sep. 1; Order, Nov 22; and Order, Dec. 18, 1909, all in 181-39, Box 19, #3703.

79. General Order No. 62, Aug. 17, 1915, 181-39, Box 212, #1174.

and mechanics, based on wages paid by private firms in the vicinity to employees doing the same or similar work. The proposed schedule then required the approval of the commandant and the Secretary or the Assistant Secretary of the Navy.[80]

In 1900, the frequency of new schedules changed from quarterly to semi-annually, and in 1905 to annually. Beginning in 1906, the wage board started its deliberations in November on a schedule to take effect the first day of the following January. The Navy preferred not to alter a wage rate until the expiration of a current schedule, but occasionally exceptions were made. For example, in August 1900, the Board on Wages at the Boston Navy Yard submitted a supplementary report, advising the Navy of a substantial increment in the wages paid pavers in the vicinity and recommending an increase of forty-eight cents a day for yard pavers. The Assistant Secretary concurred with that recommendation. By 1914, however, the Navy had become increasingly reluctant to modify a schedule once placed into operation.[81]

From an administrative point of view, preparing one wage schedule a year instead of two or four was advantageous because it reduced the burden on the five members of the wage board, all of whom held important positions in the yard, some being department heads. The board was required to identify firms

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80. For an example of a completed schedule of wages, having the signatures of the five-man wage board, the commandant, and the Assistant Secretary of the Navy, see Schedule of Wages for 1904, 181-123, Box 7, vol. for May 8, 1901-May 23,1904.

81. McPherson and Watts; Acting Secretary to Commandant, Aug. 29, 1900, 181-105, Box 3, vol. for 1898-1901.

employing men in trades found in the yard and to send them a form requesting information on wages. The board preparing the 1908 schedule mailed such forms to 186 employers. Only half of the firms responded. Nevertheless, the board had to analyze the data in ninety-six responses. Then the board conducted hearings, at which yard employees could make verbal presentations respecting the new schedule and submit documents to buttress their arguments.[82] In 1907, employee hearings stretched over six days.

After implementation of a wage schedule, questions concerning it might be referred back to the board that had proposed it. This occurred in 1902, upon complaint to the Secretary of the Navy by the Upholsterers' Union, Local 53, that its members employed at the yard were not being paid at a rate comparable to that received by upholsterers of firms in Boston. The board collected additional information from four large companies and reported that first-class upholsterers in the yard received slightly higher wages than did their fellow artisans at work in the private sector.[83]

Becoming more common was the practice whereby workmen at the yard or their unions with complaints about wages wrote directly to the Navy Department. This is understandable, since often employees were protesting decisions reached by yard officers and since authorities in Washington had the final voice. In 1909, a two-man committee representing patternmakers explained their

82. Commandant to Members of Wage Board, Oct. 31, 1907, 181-123, Box 8, Bound Reports, vol. for 1907-8, pp. 34ff.

83. Board to Commandant, Feb. 10, 1902, 181-123, Box 7, Boards, vol. for May 8, 1901-May 23, 1904, p. 21.

direct approach to the Secretary of the Navy by noting that a letter to him the previous year, routed through the commandant, never left the yard. Moreover, in 1908 and 1909, patternmakers had appeared before the yard wage board, but failed both times to influence the board. From the cases of the upholsterers in 1902, the patternmakers in 1909, and other instances, it seems one source of disagreement arose from the fact that navy yard employees and workers for private establishments did not have identical working hours and conditions of employment. Civilian employees of the Navy enjoyed half-holidays on summer Saturdays, a number of full holidays each year, and also fifteen days annual leave. By considering those arrangements in different ways, it was possible to arrive at different conclusions as to conformity of navy yard wages with those of commercial establishments.[84]

By the outbreak of World War I, the fixing of wages at the Boston Navy Yard had become a controversial matter. Unions and workers continued to complain about specific rates of payment and also questioned the mechanics of the system. In 1913, a "Committee representing House Carpenters in the Yard" raised the problem of wage increases granted by area firms during the calendar year. The commandant was informed that it had recently become the practice of organized journeymen carpenters in Boston and companies belonging to an association of contractors to reach agreement on wages as of June 1. This meant that yard carpenters

84. W. A. Clough and H. Callahan to Secretary of the Navy, Dec. 8, 1908, 181-39, Box 11 (1909), #2406.

generally received less than the prevailing rate for seven months. The committee sought to have this matter brought before a special board, meeting in Washington, to consider the matter of wages in the various navy yards in the nation.[85]

The meeting in Washington apparently was instigated by the new Assistant Secretary of the Navy, Franklin D. Roosevelt, who sought to reform the system of yard labor boards. In his comments to the press and to workers' representatives, Roosevelt said he welcomed employees' input into decisions made at and for navy yards.[86] Although little resulted from the 1913 Washington conclave on wages, the word spread about the Assistant Secretary's receptivity to the views of workers. Among the results may have been the request from several employees' committees in the Boston yard that a workmen's representative be included in the composition of the yard wage board.

That notion was assaulted by E. L. Beach, the Engineering Officer at the Boston yard. Beach, a member of the Board on Wages for three years, defended the existing system and dismissed the idea of a workers' representative as "entirely illogical" and "entirely uncalled for." The Engineering Officer resented the inference "that justice to the navy yard workmen is not done." During his services on the board, he never saw among its members "a single instance...or disposition that was unsympathetic with just demands for wages." Moreover, he believed that the data the

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85. Committee to Commandant, n.d., 181-39, Box 131 (1913), #15.

86. Frank Friedel, Franklin D. Roosevelt: The Apprenticeship (Boston: Little, Brown and Co., 1952), p. 19.

board received from industrial establishments was reliable because of the guarantee of confidentiality. If the system had a bias, claimed Beach, it favored yard employees. He further stated that he had

> personally frequently been expostulated by employers on the ground that we paid higher wages...than were paid by the industrial concerns, that their men always are using the navy yard pay as more or less a club....

The officer concluded with the assertion that appointment of a workers' representative to the board "would be analogous to appointing in a civil case for damage, an attorney for the plaintiff as a member of the jury."[87]

A few months later, the yard had a new engineering officer, Y. A. Williams, who seemed to take a more flexible position. Williams recommended that the master mechanics be called before the Board on Wages and questioned regarding the wages paid by private manufacturers and ship repair firms. Although yard employees, master workmen held permanent appointment and thus should have "the absolute interest of the Government at heart and not the interest of individual workmen." Williams's proposal has the appearance, but not the substance, of a concession to workers. He regarded it as a means to insure "equal distribution of labor charges to the employee and to the employer."[88]

Navy yard commandants shared the standpat position articulated by Williams's predecessor, and they successfully resisted

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87. Commandant to Secretary of Navy, Jun. 19, 1913, 181-39, Box 131, #158.

88. Y.A. Williams, Memorandum for Commandant, Jul. 3, 1913, 181-39, Box 131, #158.

any structural changes in the wage-fixing system. Roosevelt was able to make a few modest alterations, chiefly having the deliberations of wage boards begin in October instead of November. This afforded workmen a greater chance to respond to a proposed schedule. Also Roosevelt made arrangements, when workers at a particular yard desired, to send a representative of the Navy Department to that yard to conduct hearings on wages.[89]

Whether in the early twentieth century the Navy paid its yard employees just wages is difficult to determine. One of Roosevelt's biographers, partial to the Assistant Secretary's efforts to reform the wage system, contends that navy yard workers "were generally employed for less than the prevailing wage scales in nearby private industry."[90]

An easier task is analyzing changes in the wage schedules used at the Boston yard. The wages for those trades listed in the schedule increased by about fifteen percent between 1899 and 1914. Generally, the increase was less for Group I (laborers) and Group II (helpers) than for mechanics (Group III). Wages improved most dramatically for stone masons, up from $3.52 to $5.20 per day; furnace heaters, $3.52 to $4.88; and pipefitters, $3.04 to $4.00. The pay of ropemakers decreased from $3.28 in 1899 to $3.12 in 1914. Only small increases occurred in wages of heavy forgers, $4.56 to $4.64; blockmakers, $3.04 to $3.12; and

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89. Friedel, p. 203; Assistant Secretary of Navy to Commandant, Nov. 22, 1915, 181-339, Box 289 (1916), #158.

90. Friedel, p. 198.

chainmakers' helpers, $2.32 to $2.40.[91] In 1913, chainmakers' helpers conducted a strike because of their wages. Probably large numbers of Boston Navy Yard workers experienced exigency in their personal finance during the period 1900 to 1914 because of the steady increase in the cost of living, roughly fifty percent.

For many laborers, helpers, and mechanics, the issue of wages was joined with the opportunity for increased pay resulting from overtime. Between 1900 and 1916, workers at the Boston yard rarely exceeded eight hours a day, and overtime never became routine. Beginning in 1900, Navy regulations provided that "laborers, workmen and mechanics," for work in excess of eight hours, should be paid the ordinary rate plus fifty percent additional. Those same regulations prohibited exceeding eight hours except in emergency situations. Courts and government authorities defined such situations in exceedingly narrow terms.

Essentially, overtime at the Boston yard was allowed only with the permission of the Secretary of the Navy. Undocking a battleship on Sunday met the requirement, at least in the case of Rhode Island, removed from Dry Dock No. 1 on October 29, 1905.

That undocking marked the first time foremen, master mechanics, quartermen, or leadingmen received extra pay for overtime work. Until then, an 1873 ruling disallowed overtime pay for master workmen. In December 1904, such workmen in the

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91. This discussion is based on analysis of the wage schedules for 1894, 1903, 1908, and 1914; Wage Board to Commandant, Dec. 21, 1893, 181-123, Box 6; Commandant to Wage Board, Nov. 10, 1903, 181-123, Box 7; Schedule of Wages, Dec. 10, 1907, 181-123, Box 8; Wage Schedule for 1914, 181-39, Box 173, #1158.

Boston yard appealed to the Navy Department to overturn that ruling. Master mechanics in other yards also protested, and in July 1905, the Comptroller of the Treasury and the Secretary of the Navy held that supervisory workmen were "laborers, workmen or mechanics within the meaning of the eight hours law...."[92]

Some workers had to be concerned with the likelihood that they would be discharged or furloughed for want of work or lack of funds. For Groups I, II, and III, navy yard work could be highly irregular. To trace the work record of even a single employee over a number of years would require much research, and to offer a statistical generalization would be impossible. Strictly at random, a time card for one mechanic in 1908 has been selected for analysis.

John T. Russell, registrant No. 5280 and check No. 120, began his employment at the yard June 12, 1900. In 1908, Russell held the rating of shipwright fourth class, with a wage of $2.80 per day. His earnings at the yard totaled $306.05 for 1908, or rather from January to October of that year. He worked seventeen days in January and only three and two-eighths days in February. On seven full days in February, work was suspended because of weather, and on another Russell put in two hours before weather again closed his shop. He also failed to report for work on seven other days during the month. Russell was furloughed for twelve consecutive days in the middle of March and for the period April 1 to June 15. He worked steadily from mid-June to the first

92. Naval Constructor to Commandant, Oct. 10, 1907, 181-38, Box 1; McPherson and Watts.

of October, except for four days of paid leave. As of October 6 and without explanation, entries on his time card cease. There appears no rating of Russell's conduct or workmanship, but that he was furloughed and not discharged speaks well for him.[93]

Russell's work record reveals the damage inflicted by winter weather to the yard routine and to employees' pay envelopes. Even more striking are the long furloughs. Regulations restricted furloughs to no more than ten days, but Russell had furloughs lasting twelve and thirty-six and a half days.

A general review of the work record of another employee appears because of an inquiry received by the yard from the Associated Charities of Boston. In 1909, that organization sought information about William Butler, "colored," especially about his "character and business ability." The Labor Board summarized Butler's career at the yard. Employed as a holder-on on May 21, 1904, he worked until January 1905. His next service lasted from July 1905 to July 1906. After a twenty-one-day break, he was employed for two weeks. In each instance, Butler had been discharged for lack of work and given discharge ratings of "good" for both conduct and workmanship.[94] For men such as Russell and Butler, navy yard employment was irregular and temporary.

Except for paid holidays, navy yard workers at the end of the nineteenth century had no "benefits," as that term is used today. Changes were proposed and a few adopted during the

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93. John Russell, Time Card, 181-33, Box 60, vol. 81.

94. Associated Charities of Boston, Oct. 5, 1909, 181-39, Box 9.

Progressive Era. In 1901, Congress granted employees at navy yards "fifteen working days' leave of absence each year without forfeiture of pay during such leave." That benefit was restricted to those serving twelve consecutive months. Congress further stipulated that "heads of divisions" had authority respecting the timing of such leaves and that absence "on account of sickness" should be deducted from the fifteen days of leave.[95]

As instituted at the Boston Navy Yard, the leave policy granted no leave to workers during the first year of employment, thirty days during the second, and fifteen in each year thereafter. Since furloughs, discharges, and unauthorized absences disrupted continuity of service, leave time was computed on a pro-rata basis, workers receiving one and one-quarter days of leave for every thirty days of employment. There seems to have been no difficulty in obtaining permission to take a leave of absence, and leave days were often requested and granted on the spur of the moment. Frequently, leave time was employed to cushion furloughs. Per annum employees were eligible for thirty days of leave a year. In certain cases involving health matters, the Secretary of the Navy could authorize thirty days additional leave for per annum employees. After 1909, the Secretary also had power to award fifteen additional days of paid leave to per diem workers in the yard's clerical, drafting, inspection, and messenger forces for special cases involving sickness.[96]

Prior to 1914, no system existed to provide for navy yard

95. Navy Yard Order No. 198, Mar. 20, 1909, 181-39, Box 6, #2401.

96. Manual for Accounting Officers, Beginning July 1, 1915, 181-39, Box 213, #122R.

employees injured on the job, even when there was negligence on the part of the government. Frequently subscriptions were taken up among officers and fellow workmen to assist such employees and their families. In 1902, the Secretary of the Navy recommended legislation to assist injured workers. Provisions were made a dozen years later for disability arising from on-the-job injury resulting from circumstances not involving the worker's negligence and misconduct. After fifteen days had elapsed, such a worker was entitled to his wages until he was able to return to work or until a year had expired. Should an injured worker die while disabled, his widow, children or, dependent parents would be paid his wages for the remainder of the year.[97]

With the increase in the number of workmen, accidents became more common at the Boston Navy Yard. In the month of September 1914, for example, 119 accidents resulted in injuries to employees. During that month, there were twenty-nine disabled workers and 357 days lost due to injuries. In the following November occurred eighty-three accidents. Seventeen men were disabled and 1030 days lost.[98]

The Navy had no retirement program for older employees. Grounds exist for the suspicion that occasionally workers of advanced years and with long service in the Boston yard became shipkeepers or watchmen or filled other positions requiring less physical effort. Such arrangements were sought by the

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97. Changes in Navy Regulations and Navy Instructions No. 3, 181-39, Box 175 (1914), #19.

98. Medical Officer to Commandant, Dec. 8, 1914, 181-39, Box 161, #13.

construction officer in 1900 on behalf of a seventy-three-year-old quarterman shipfitter, Ezra L. Hersey. A conscientious and faithful employee for many years, having been appointed quarterman shipwright in 1877, he had proved "exceptionally careful and skilled in docking ships." The head of the Construction and Repair Department recommended he be transferred "to the post of dockmaster, where his large experience will be available, yet where the tax on his strength will not be so great...." Accomodations of this type could be made only for a favored few, and a formal program was required. This was suggested by the Secretary of the Navy in 1911.[99]

Workers' Grievances

Consideration of employees' complaints provides a revealing insight into the workings of the Boston Navy Yard. The government did not accord its employees the right to have unions represent them in matters of wages and conditions of employment. Many yard workmen belonged to locals in the Boston area, and those organizations or their regional or national headquarters contacted the yard administration or the Navy Department concerning grievances. But unions had no official function in the yard. Nor, except briefly, did the yard have a specific ombudsman or officer in charge of employees' complaints.

The procedure preferred by the yard administrators was for workers to communicate complaints to leadingmen and quartermen,

99. Naval Constructor to Commandant, Oct. 1, 1900, 181-16, Box 11, vol. for Aug. 3, 1900-Jan. 14, 1901, p. 161; Report of Civilian Employees, Dec. 1897, 181-113; ARND, 1911, p. 20.

and, if need be, up the hierarchy of foreman or master mechanic, shop or ship superintendent, department or division head, commandant. Several commandants implied a policy existed on their part of being ready at all times to hear complaints of employees. At least they seemed offended when workers, without consulting them, took bold steps. For a workman to speak to the commandant or another officer during working hours may have been difficult, since he would have to obtain permission from his immediate supervisor to leave the job. Frequently, the noon hour was used by employees to visit the office of an administrator. Also written complaints became common, some of them forwarded from the yard to Washington. Apparently, the volume of workers' grievances increased, leading to a short-lived board on complaints in 1913.

Allegations of wrongdoing against supervisors could lead to formal inquiries and disciplinary action, as evident in the case of master electrician L. C. Brooks.[100] In several instances, worker dissatisfaction produced threatened strikes and one actual strike.

Doubtless, the wage schedule and its method of preparation produced the largest number of complaints during the period. Also fairly common were protests against being discharged, although most laid-off workers probably took such events in stride, seeing them as part of the life of navy yard workmen and hoping to be reemployed again soon. Allegations of irregularities or injustices in the discharge process in one

100. See below pp. 261-5.

instance resulted in an official inquiry, in part because of the intervention of a political officeholder. After his discharge in February 1900, first-class rigger Robert Cowley contacted Congressman Peter Tague, whose letter to the Secretary of the Navy led Commandant Sampson to appoint a board of three officers to investigate.[101]

Several complaints during the period dealt with uncompensated work or failure to receive the proper overtime pay. As noted above, the yard's master mechanics in 1904 successfully petitioned to be treated like other workers respecting overtime. In July 1908, Steam Engineering firemen claimed unjust treatment when they worked on legal holidays. They argued that the law did not require them to work on holidays and that when they did, they should receive two days' pay. Their petition noted that firemen in the Yards and Docks Department received $5.60 for holiday work, while those of Steam Engineering were paid only the normal per diem rate of $2.80.[102]

Painters in 1908 presented a written grievance to Commandant Swift, alleging they in essence worked an additional hour each day. The extra time was required, since they had to report at the paint shop ten or fifteen minutes early in the morning to give them time to carry their paint and equipment to the work site before the morning bell sounded. They lost a similar amount of time after the noon bell, since they had to return their empty

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101. Commandant to Capt. N. M. Dyet, Mar. 7, 1900, 181-105, Box 9.

102. Firemen, Steam Engineering, to Commandant, Aug. 11, 1908, 181-33, Box 59, vol. 80, p. 42.

pails to the shop for refilling. The same routine occurred in the afternoon. The painters were unsuccessful in their protest. A change occurred seven years later, when painters were permitted to stop work ten minutes before noon, in order that they could properly wash up as protection against lead poisoning.[103]

The National League of Government Employees, whose president was a yard worker, protested in 1915 that molders' helpers "were compelled to work" in excess of eight hours during eleven days in January and February. The engineering officer explained to the commandant that, on those occasions, it was necessary for the helpers to tend the cupolas after metal had been poured in the afternoon. The men had been retained no longer than necessary, and the practice had been accepted by the Navy.[104]

One category of workers' grievances dealt with the cognizance of the various trades and shops, and mechanics or their unions protested that work properly belonging to them was being performed by men in other trades. One such instance occurred in 1903, when the general organizer of the United Association of Journeymen Plumbers, Gasfitters, Steam Fitters, and Steam-Fitters' Helpers complained against machinists and "handymen" doing the work of plumbers and steam fitters. Four years later, the same union held that coppersmiths had no right to engage in the lead lining of pipes, a plumber's job. Assistant Secretary of the Navy Roosevelt received a complaint in 1913 that five

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103. Painters to Commandant, Jul. 24, 1908, 181-33, Box 60, vol. 81, p. 8.

104, Engineering Officer to Commandant, Feb. 15, 1915, 181-39, Box 224, #159.

house carpenters had been discharged because of lack of work, but that four wharfbuilders had been hired and put on jobs traditionally those of carpenters. The recently formed Board on Complaints, consisting of the captain of the yard and four other officers, reported that a single wharfbuilder had been taken on and that the wharfbuilders performed only one small job which might have been suitable for carpenters.[105]

A variation of the cognizance protest was filed in 1911. An officer of the United Housesmiths and Bridgemen, Local No. 7, became alarmed at reports that the yard was abolishing "the trade of Ordnanceman" and that "in the future the enlisted men will be compelled to do" that work. The response to this protest has not been found, but the union had erroneous information. The 1913 table of organization for the Boston yard shows twelve ordnancemen in the Machinery Division and four in the General Storekeeper's Department.[106]

Some workmen's groups advocated major alterations in navy yard regulations respecting civilian workers. A Civil Service employees' association requested that all classified workers be placed on a per annum basis. A newly formed Master Mechanics Association proposed more sweeping changes. It recommended the reappointment of all master workmen and quartermen-in-charge to their existing positions at a base annual salary of $2200. Also, there should be increments depending on length of service at the

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105. Commandant to Secretary of Navy, Feb. 2, 1909, 181-39, Box 11, #2604; United Association of Journeymen Plumbers to Commandant, Oct. 1, 1913, 181-39, Box 133, #161.

106. H. B. Sullivan to Commandant, Dec. 12, 1911, 181-39, Box 113 (1912), #2406.

yard: ten percent additional increase for those with five years of service; another ten percent for those with ten years; and still five percent more for each further five years. An identical scheme was advanced for special mechanics, only starting with a base salary of $1800. The Master Mechanics Association sought a pension program for all of its members, consisting of the annual payment of one-half the salary received "just previous to retirement" and a similar arrangement for those who became disabled.[107]

The proposals of the Master Mechanics Association and several of the other protests came during the period December 1908 to May 1909, when the Newberry scheme of yard reorganization was being implemented. That scheme disturbed many employees because of the consolidation of departments, offices, and shops under the manager, Naval Constructor Elliot Snow. At a meeting on March 3, 1909, Boston Branch No. 2, National Association of U.S. Civil Service Employees, adopted resolutions highly critical of the establishment of the consolidated Manufacturing Department. One resolution referred to the "involuntary transfer" of Civil Service employees to the new department and voiced fears about the fate of those clerks who remained under the former department heads, now mere inspectors. The most serious complaint alleged that the Manufacturing Department was primarily an enlargement of the old Construction and Repair Department and that the chief clerk and other supervisory clerks in that department retained their positions, while those being

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107. Acting Secretary of Navy to Commandant, May 18, 1909, 181-39, Box 6, #14052; Charles R. Cowley and Charles O. Bourne to Commandant, Dec. 10, 1908, 181-33, Box 60, vol. 81, p. 78.

transferred became subordinates. A further grievance held that the implementation of consolidation required "an excessive amount of overtime" by clerks.[108]

The commandant regarded the complaints of Branch No. 2 as premature and defended Manager Snow. George Meyer, Secretary of the Navy, responded to the resolutions with some heat. He stated: "The Department heartily approves of the action of the Naval Constructor and any of the classified employees who are dissatisfied are at liberty to tender their resignations."[109]

Consolidation brought forth other complaints. George L. Cain, president of the National League of Employees of Navy Yards and an activist in the Boston Branch of the National Association of Civil Service Employees, wrote directly to Secretary Meyer about his own circumstance. Cain worked in the instrument repair room of the former Steam Engineering Department under the master machinist afloat. As a result of the consolidation, the tools and equipment of the instrument room ended up in several different locations in the yard, and Cain came under the supervision of a master electrician who, allegedly, knew nothing about Cain's type of work. Cain informed the Secretary that he had had an interview about the matter with Senator Henry Cabot

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108. William H. Bric to Secretary of Navy, Mar. 3, 1909, 181-39, Box 6, #2404; Commandant to Secretary of Navy, Mar. 20, 1909, 181-39, Box 6, #2404.

109. For unknown reasons, Meyer sent two letters on this matter, both addressed to the Boston Navy Yard commandant, both bearing the same date, both having the identical first sentence. One version bears the number 2215, the other 2216. The quote is taken from 2216. Secretary of the Navy to Commandant (two versions), Mar. 22, 1909, both in 181-39, Box 6, #2405-1 (2215) and #2402 (2216).

Lodge "at the Headquarters of the State Republican Committee, Boston."[110]

Like the resolutions of Branch No. 2, Cain's protest was premature. But his comments, those resolutions, the proposals of the master workmen, and other complaints of workers lodged at the same time suggest that consolidation of the Boston Navy Yard had the unintended effect of encouraging employees to seek organizational backing in the protection of their interests at the yard. The Progressive Era generally saw an increase in associational activities in the United States, and workers at the Boston Yard, perhaps particularly because of the reorganization, seem to reflect that tendency.

By the spring of 1915 at least seven different workers' associations existed to which yard employees belonged. Those organizations were: National League of Employees of Government Naval Stations and Arsenals, George Cain, president; American Society of Marine Draftsmen; National Association of United States Civil Service Employees of Navy Yards and Stations, for clerks, messengers, subinspectors, and other white-collar employees; U.S. Civil Service Retirement Association; Master Mechanics Association, Boston Navy Yard; National Association of Leadingmen and Quartermen of the U.S. Navy Yards, James Connerton, Boston Navy Yard, president; and International Association of Machinists, Bunker Hill Lodge, No. 634. The last mentioned was composed exclusively of Boston Navy Yard mechanics. In addition, numerous labor unions, other than the machinists'

110. George L. Cain to Secretary of Navy, Mar. 26, 1909, 181-39, Box 19, #3701.

local, included Boston yard employees among their members and served as spokesmen for them when the occasion arose.[111] The emergence of a large number of employee organizations consisting of or representing workers in the yard constitutes an important development during the decade and a half before World War I.

Complaints Against Employees: Three Cases

The Navy preferred to deal with its employees on an individual basis, rather than through a union or some other type of organization. In instances of serious charges brought against a worker or by a worker against the yard administration, a board of officers was generally convened to conduct an inquiry. Three cases during the years 1900 to 1914 illustrate that process and also give further insight into the operations of the yard, particularly respecting civilian employees.

Civil Service regulations deprived navy yard foremen of the authority to hire or fire workers. However, they still had power over men in their charge. They could recommend to the head of the department or division that an employee be upgraded or lowered in his rating, suspended, or discharged. In an institution the size of the Boston Navy Yard, it was to be expected that a few supervisors would use their authority in improper fashion. Master electrician L. C. Brooks fell into that group, and in 1909 charges against him by a discharged leadingman led to a protracted inquiry. Consolidation had enlarged the number of men in Brooks's charge, the electricians shop of the Manufac-

111. Commandant to Secretary of Navy, Apr. 12, 1915, 181-39, Box 231, #159.

turing Department having eight leadingmen and 144 electricians, wiremen, helpers, and laborers.[112]

The revelation of Brooks's improprieties began when a leadingman electrician, C. A. Schmitz, was discharged. Schmitz had remained at home one day because of illness in his family, and had not reported another because of service with the National Guard. Upon returning to the yard following a three-day absence, he learned that Brooks had reduced him from leadingman to electrician first class. Rather than comply with what he considered an unjustified demotion, Schmitz took a few days of leave to consider the situation. Although the former leadingman was entitled to leave, Brooks had him discharged for missing six consecutive musters. Schmitz submitted evidence of excusable absences, and the commandant gave directions for his reinstatement. However, neither the assistant naval constructor in charge of Manufacturing Department personnel nor the Labor Board so informed Schmitz. When petitioned by Schmitz, the commandant ordered an investigation to determine what had happened.

The board of officers revealed that Brooks had used Schmitz's absences to get rid of him and that later he had destroyed the ex-leadingman's leave card to eliminate evidence that Schmitz had leave due him. Brooks, as it appeared, took those actions because of Schmitz's refusal to cooperate in

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112. Monthly Report Showing Force Under Foremen, etc., Jun. 1909, 181-39, Box 11, #2406-3. Information on the Brooks matter is provided in a large file with the title "Brooks Investigation," 181-39, Box 6, #1405-2-B.

improper activities in the electrical shop.

Brooks had favorites in his work force, one of whom was leadingman C. J. Donahue. Probably at Brooks´s instigation, and certainly with his knowledge and approval, a subscription was collected from workmen in the shop to give Donahue a gift of money as a wedding present. Brooks contributed two dollars. Navy regulations clearly prohibited such solicitations. Probably violations of this rule were often overlooked, so long as the subscription was for a proper cause, its collection did not interfere with work, and no coercion was applied. In collecting the Donahue fund, two of Brooks´s favored workmen, James Ago and C. V. Crowley, spent "many hours" during work days soliciting money. Moreover, employees who refused were harassed and even discharged. One of these was Schmitz. Another was electrician A. W. Stowe.

When Stowe and his helper first heard of the Donahue subscription, they decided not to contribute, the helper "being a married man and on such small pay," and Stowe, because he supported a sister. However, "rumors were going around" as to the consequences for noncontributors. Whereupon, Stowe and his helper each gave a dollar, "rather than be in the wrong with the people" behind the Donahue gift. When he learned that the wedding was ten days later than he first believed, Stowe withdrew his dollar, informing Ago to come back after the next payday. Before he had the opportunity to resubmit his donation, Stowe was discharged, allegedly because of lack of work.

The inquiry revealed that before the incidents involving the

Donahue money, Brooks had summarily disrated several workers without cause, that he "bulldozed and dogged" another leadingman into resigning, and that one his favorites, Crowley, served as a spy, reporting back to the master electrician discussions about him among the workers in the shop. On the basis of a report produced from twenty-nine days of testimony, Commandant Swift concluded that "Mr. Brooks' usefulness at this yard is at an end and he should be severely reprimanded for his methods, reduced in rating and transferred elsewhere." Admiral Swift also recommended that "Mr. C. V. Crowley should be discharged as an undesirable character and not allowed to reregister."

In addition to foremen, several other groups of employees in the Boston Navy Yard held positions of authority which might be misused. The numerous building construction projects during the early twentieth century created opportunities for illegal or improper actions by those responsible for approving the work of private contractors. Such men were assistant inspectors or sub-inspectors in the Yards and Docks Department. In 1904, one contractor lodged a number of complaints against Charles W. Curran, the Yards and Docks subinspector of concrete,

Connors Brothers Construction Company, doing some of the repairs on Building No. 42, claimed that Curran sought and accepted payoffs from contractors. Those who refused suffered condemnation of their materials, delays, and harassment. Those who obliged Curran, allegedly the company of L. L. Leach, received his cooperation and prompt approval of their work. The Leach company had several contracts, including other work on

Building No. 42, sewers, the Construction and Repair smithery, and the Yards and Docks building. According to Connors Brothers, after he reported to the civil engineer that Leach had satisfactorily completed one contract, the company gave subinspector Curran two hundred dollars. The complaint also alleged that Leach or another contractor seeking the good graces of Curran, put a new roof on property of Curran's mother without charge.[113]

Supposedly, because Connors Brothers did not go along with Curran, the subinspector required the firm to comply with regulations not enforced with respect to other contractors. It was also claimed that Curran condemned the company's gravel and part of their bricks and that he harassed and insulted their workmen.

The serious accusations against Curran produced a lengthy inquiry by a board of yard officers, which heard testimony and collected evidence. The charges brought by Connors Brothers backfired, and the board concluded that no substantiation existed for the complaints. Commandant George F. F. Wilde concurred, and, because the investigation disclosed faulty work by Connors Brothers, he recommended to the Secretary of the Navy that the firm "be barred from further bids on Government work, as being unreliable and unworthy of future considerations."

The most common problems Boston Navy Yard administrators had with civilian employees were failure to report to work, tardi-

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113. Record of Proceedings of a Board of Investigation into Allegations Made against Chas. W. Curran..., n.d., 181-123, Box 7.

ness, and loafing on the job. Fighting among workmen probably was overlooked by supervisors, so long as it consisted of a harmless, brief exchange. It was another matter when an incident disrupted work, involved a man already known for fighting, included a particularly vicious type of personal animosity, and was reported upwards through the hierarchy of supervisors. Thomas Brice and Cally Banks, a black worker, were the principals in such an incident occurring in January 1906.[114]

Brice and Banks, both laborers, were at work on the cruiser New York, passing baskets of cellulose from a cofferdam. According to testimony collected later, epithets flew and blows followed. Brice denied calling Banks a "black son of a bitch," and Banks admitted slurring Brice's sexual activities. Because of the confined passageway in which they were working, the two decided to go topside and fight it out in earnest. Hearing the commotion, leadingman laborer Thomas Brennan went on deck, separated the two, and instructed them to return to work. Banks started to comply, but Brice "made a pass at him again." When reprimanded by his foreman, Brice stated: "It's like this, Brennan, those black bastards...are getting too much leeway in the Yard."

On the basis of Brennan's verbal report, the quarterman laborer-in-charge prepared a written account for the naval constructor, which included the recommendation that Brice be punished. That recommendation was based in part on the knowledge that Brice had been involved in a previous fight. For his role

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114. Report of Board to Commandant, Jan. 24, 1906, 181-123, Box 7.

in the latest incident, Brice was discharged with a conduct rating of "Poor." Brice immediately sought the intervention of his congressman, who asked Commandant Albert S. Snow to reconsider the case, seeking any "mitigating circumstances." The naval constructor agreed to a further investigation, and a board of inquiry was convened.

The board collected testimony from Brice, Banks, Brennan, and others, giving Brice an opportunity to be present and question all who appeared. The inquiry produced the conclusion that no one had witnessed the events in the passageway and that who started the brawl could not be determined. From his remarks to Brennan on deck, it might be "inferred" that Brice was the aggressor, "being influenced against Banks by racial antagonism and unwillingness to work with one of the negro race." Brice was regarded as a good laborer, but of quarrelsome disposition. However, the evidence showed only one other case of actual fisticuffs in three or four years, which afforded no basis for assuming "beyond reasonable doubt" that Brice was the aggressor in the altercation with Banks. The absence of reliable evidence as to which party instigated the fight served as the mitigating circumstances, and Brice's discharge card was changed to read "conduct good." This would hasten his return to the yard.

Labor Unrest

In 1913 and 1914, the Boston Navy Yard encountered serious labor problems. Several remote and immediate elements contributed to those difficulties. Many navy yard workers may have anticipated greater sympathy from Washington, with the

inauguration of President Woodrow Wilson in 1913, the first Democratic administration in twenty years. Particularly blue-collar Irish- Americans identified their interests with that party. Also Wilson appointed Franklin D. Roosevelt as Assistant Secretary of the Navy, who in his early months in office, indicated his desire to cooperate with navy yard labor. Perhaps in the background of the labor unrest at Boston stood a twenty-month-long recession. Certainly at work was the rising influence of organized labor in the United States. In 1900, somewhat less than 800,000 of the nation´s workers belonged to unions. By 1916, union membership had risen to slightly more than two million. Although government workers could not bargain collectively, they could and did belong to unions and shared the sentiments of organized labor.

One labor flare-up at the Boston Navy Yard resulted from efforts to extend the principles of scientific management to the routines of workmen. Another incident involved a strike in the chain shop.

Throughout America, labor viewed Taylorism with hostility, seeing it as a means of exploitation and of reducing the number of workers needed in an industrial establishment. Under Secretaries Newberry and Meyer, Taylorite principles entered navy yards in the form of shop consolidations and the establishment of central office planning. Bringing stop watches and time sheets into the shops appeared as the next step. When the War Department experimented with the Taylor scheme at the Watertown Arsenal, workers´ protests led to an investigation by the United States Senate. Navy officers divided on the merits of scientific

management. Older line officers often preferred traditional procedures and agreed with labor's suspicion of the new techniques. Younger officers, particularly naval constructors, were attracted to plans to increase efficiency at navy yards.

When first introduced into the shops of a navy yard in early 1912, scientific management produced a strike. The Norfolk Navy Yard was selected for an initial testing of a Taylor-type system, preliminary to its general usage in all yards. On January 3, the Norfolk commandant insisted that mechanics make out work slips on which they entered the details of the work performed, the time consumed, and the material used. Such slips would be studied by the central office, and standards established for all work routines. Eight hundred machinists, boilermakers, coppersmiths, plumbers, and pipefitters refused to comply and staged a walkout The strikers faced discharge for missing six consecutive musters. Some held out for two weeks, but the bulk had returned earlier and agreed to accept the work slips.[115]

On the basis of the experiment at Norfolk, the Navy made modifications in the system, did further testing in the Machinery Division at Philadelphia and the central office at Puget Sound, and ordered the modified system installed in all yards. In the spring of 1913, two naval constructors in the Boston yard Hull Division began a partial application of the system in the form of job sheets. Capt. Dewitt Coffman, commandant since 1911, objected and threatened the two officers with disciplinary action. Organized labor, in the form of the Boilermakers and

115. New York Times, Jan. 4, 1912, p. 5; New York Times, Jan. 21, 1912, p. 8.

Sheet Metal Workers Union, protested and, in a letter hand carried to Washington by Congressman James M. Curley, threatened a strike. Advised of the letter, Commandant Coffman met with representatives of yard workmen, and a settlement was worked out, which included the transfer of the two officers.

Workers in other navy yards joined the protest, and a delegation was sent to Washington to confer with Assistant Secretary Roosevelt, hopefully to extract from him a pledge to stop utilization of the system of shop management until a thorough investigation had been made. Roosevelt essentially agreed and made a visit to the Boston yard on May 19. In the morning he inspected buildings and listened to Coffman's account of the labor difficulties. In the afternoon, he met with workmen and appeared sympathetic to their views, but insisted that some sort of office planning and shop standards were required. Before departing, he informed assembled workers, officers, and reporters that the yard would be equipped to build auxiliaries and ultimately larger vessels, that more new battleships would be repaired at Boston, and that changes were likely to occur in the yard's roster of officers.[116]

Prior to the difficulties at the Boston yard, Roosevelt had been attracted to Taylor's ideas, seeing in them a way to achieve a record for himself of greater navy yard productivity. Regardless of the impression he gave Boston workmen and newspapers, his inspection tour did not persuade him otherwise. Yet

116. Friedel, pp. 196-205; Kenneth S. Davis, FDR: The Beckoning of Destiny, 1882-1928: A History (New York: G. P. Putnam's Sons, 1972), pp. 316-8.

his political instincts led him to refuse to make a concrete decision other than to oppose the imposition of any system on unwilling workers. Congress, also sensitive to political currents, took a definite stand and in the next naval appropriations act outlawed efficiency systems.

Coffman and Roosevelt probably prevented a walkout, such as had occurred at Norfolk, and appeared in sympathy with the workers. Neither of them displayed concern for employees in the chain shop strike at the Boston yard in the summer of 1914.

Wages constituted the original cause of that strike, although other issues later intruded. In January 1907, per diem wages for first-class chainmakers' helpers increased from $2.32 to $2.40, and that rate prevailed into 1914. During preparation of the wage schedules in 1911 and 1912, the construction officer recommended to the yard wage board an increase to $2.56, but the board proposed no change. In 1913, chainmakers' helpers themselves appeared before the board and requested more pay. However, they provided no affidavits to support their position. The schedule of 1914 as recommended by the board and approved by Commandant Coffman and the Navy Department made no alterations in the wages of chainmakers' helpers. In a key respect, the Navy's system for fixing wages may have been faulty. That system sought to ascertain wages paid for the same type of labor by private industries in the vicinity of a navy yard. However, no commercial firms in greater Boston manufactured chain, most chain being produced in the Midwest and in shops that used piecework wage systems. Thus wages of workers in the Boston yard chain shop could not be related to rates paid by private companies in the

area.

During the noon break on June 12, 1914, chainmakers' helpers delivered a petition to the Hull Division Shop Superintendent, Naval Constructor Fred G. Coburn. The petition, addressed to Construction Officer William J. Baxter, sought an increase in wages from $2.32 to $2.72, and the committee advised Coburn verbally that without the forty-cent raise the helpers believed they could not continue to work. Coburn, only recently assigned to the yard, and Naval Constructor Whitford Drake, former shop superintendent, listened to the committee, which reduced its demand to a thirty-two-cent raise. Drake and Coburn prepared an endorsement in which they supported the petition. Two days later, Coburn personally delivered the document to Baxter. What Baxter did with the petition is unclear. He may have done nothing.[117]

The chainmakers' helpers waited until July 7 before their next move. At noon, a delegation sought information from Baxter as to action on the petition. He stated he would look into the matter and contact them after lunch. Without a hint of their intentions, the delegates left and immediately attended a meeting of all of the shop's twenty-five helpers. The workers decided not to report for the 1:00 muster and so informed the master

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117. Shop Superintendent to Naval Constructor, Jul. 8, 1914, 181-39, Box 173, #159. Because of the voluminous extant records for the Boston Navy Yard, reaching conclusions based on the absence of documentation in exceedingly risky. However, in the records concerning the strike which have been examined, there is no reference to Baxter's forwarding the chainmakers' helpers' petition to the commandant or to other parties. Nor is there evidence he sought to speak with the chainmakers helpers about the matter.

chainmaker. Word spread quickly through the yard, and Commandant Coffman sent a telegram to Washington, stating that "twenty-five chainmakers' helpers walked out...dissatisfied with present rate of pay."[118]

Because they had no helpers, the eight chainmakers were sent home, and the shop closed down. On the following morning, the chainmakers told the master workman and Shop Superintendent Coburn that they would not return to work until their helpers did. Coburn urged them to be cautious and to consider all alternatives, one being to work with "green helpers," which he would provide. Another was to await the decision of the Secretary of the Navy on the strikers' petition. One chainmaker elected that course, but the other seven reiterated they would resume work only with their old helpers. Following his meeting with the chainmakers, Coburn wrote a report for Construction Officer Baxter and the commandant, in which he brought a new element into the strike situation. He proposed the introduction into the chain shop of mechanical methods of chain manufacturing.

The chain shop made all of its products by hand until 1909, when began the manufacture of chain appendages, such as shackles and pins, by machine. That greatly reduced the cost of production and encouraged the search for mechanical means to produce chain itself. The Navy regarded commercial machine-made chain as "not trustworthy," since each individual link did not receive the care felt necessary. What Hull Division officers sought was a method to employ steam hammers and still provide the

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118. Commandant to Secretary of the Navy, Jul. 7, 1914, 181-39, Box 173, #159.

close attention given each separate link in the production of chain by hand. By the time of the strike, the desired methods had been developed, but the machinery not yet ordered.[119]

Construction Officer Baxter and Commandant Coffman immediately supported the recommendation and sought authority to proceed from the Navy Department. As for the original issue in the strike, Baxter recommended assigning the same wage rate to chainmakers' helpers as paid smiths' helpers. That increased the rates for second-, third-, and fourth-class helpers, but retained the existing rate for the first class, the category of all of the striking helpers. The Secretary of the Navy gave approval to that change on July 9. Four days later Roosevelt authorized inauguration of the methods for machine-made chain.[120]

There matters stood until August. Chainmakers' helpers and chainmakers did not return to work, and new machinery was being requisitioned that would reduce the need for their services. In short, the strike failed. The only remaining question was whether the officers in the yard and authorities in Washington would show any leniency toward the strikers.

During the remainder of the summer, Coffman and Baxter demonstrated a stiff position respecting the now beaten strikers. Navy regulations backed them, and other considerations encouraged a firm stand. The yard had submitted a bid for the construction of a supply ship. Certainly, yard officers wanted to demonstrate

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119. Commandant to Secretary of Navy, Jul. 7, 1914, 181-39, Box 173, #159.

120. Construction Officer to Commandant, Jul. 7, 1914; Commandant to Secretary of Navy, Jul. 8, 1914; Navy Department to Commandant, Jul. 13, 1914, all in 181-39, Box 173, #159.

that they could handle any labor contingency and that, if they won the contract, they could build the ship on schedule and within budgetary limits.

Moreover, ten days after the chain shop strike began, a smaller labor disturbance occurred, involving "certain riveters" in the shipfitters shop. That shop was engaged in the construction of two steel coal barges. The riveters in question, paid by the piece, allegedly did the easy work first, those parts of the barges readily accessible and which could be riveted quickly. Then they stopped, claiming completion of a day's work. Moreover, they argued that the piecework rates made it "impossible to make fair wages." What the construction officer described as the dilatory tactics on the part of the riveters delayed launching and completion of the barges.

In this instance, there was no solidarity in the shop, and a shipfitters' committee reported it "did not want the management to labor under the impression that the delay in the launching was in any way due to the lack of effort on the part of the shipfitters." Furthermore, the shipfitters' delegates made clear "their liking if the leading spirits among the riveters were allowed to separate themselves from Government service." That in fact occurred, and the three riveters in question took their own discharge on July 18.

Construction Officer Baxter concluded his report of this event with the statement:

> I am of the opinion that the decidedly firm stand taken by the Department in the case of the striking chainmakers and chainmakers' helpers, and the action of this committee claiming to represent the shipfitters and

> actually being deputized by the shipfitters union will aid in developing a better morale in the force of this Navy Yard than has heretofore existed.

It was his belief that leniency toward the chain shop strikers would undermine the cooperative "sentiment among the better class of workmen."[121]

In August, half of the striking chainmakers' helpers sought reinstatement, promising "to faithfully obey all instructions of the Commandant in the future." Especially in view of the progress made in conversion to machine-made chain, the construction officer and the commandant opposed reinstating the helpers, and the Navy Department was advised "the services of these chainmakers' helpers at the present time are not required." Several days later, some of the chainmakers visited the yard, informing the leadingman chainmaker that "they had a number of politicians earnestly working on their behalf." Shop Superintendent Coburn spoke with one of the chainmakers, who claimed he had been misled by the helpers. Such tactics and claims did not soften the position of the commandant and construction officer. Coffman developed the thesis that "the Chainmakers formed an unlawful combination against the Government...."[122]

The Hull Division sought to insure that none of the striking

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121. Construction Officer to Commandant, Jul. 23, 1914, 181-39, Box 173, #159.

122. Chainmakers' Helpers to Commandant, Aug. 8, 1914; Construction Officer to Commandant, Aug. 11, 1914; Commandant to Secretary of Navy, Aug. 19, 1914 and Aug. 22, 1914; Shop Superintendent to Commandant, Aug 22, 1914, all in 181-39, Box 173, #159.

workers reregistered for employment at the yard. In ascertaining that they had not, the Labor Board discovered that most of the strikers had discharge cards with entries of "Very Good" or "Excellent" for workmanship and conduct, not unusual entries for men discharged for missing six musters. Since an illegal strike could hardly be considered acceptable conduct, the Labor Board suggested changing the entries to "poor" for conduct. This was done, which barred the men from reregistering until the expiration of a full year.[123]

Despite appeals directly to the Secretary of the Navy, Josephus Daniels, and the intervention of congressmen, yard officers remained unmoved. In the meantime, production of chain by machine commenced, including making a forty-fathom shot for the battleship Wyoming. In addition, the ratings of chainmaker and chainmakers' helper were abolished, smiths and smiths' helpers now being engaged in the manufacture of chain.[124]

In November, yard officers, having thoroughly routed the strikers, began to moderate their position. Baxter still argued that "to permit these chainmakers to return to work will be disastrous to the discipline of the yard." However, Commandant Coffman and Capt. William Rush, who replaced him, favored allowing the men to reregister six months after the strike began,

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123. Construction Officer to Labor Board, Sep. 15, 1914; Board on Labor to Commandant, Sep. 18, 1914, both in 181-39, Box 173, #159.

124. Construction Officer to Commandant, Nov. 18, 1914; F. S. Deitrick to Secretary of Navy, Nov. 7, 1914; Committee of Chainmakers to Secretary of Navy, Nov. 5, 1914, all in 181-39, Box 173, #159.

instead of one year, In December, Rush contended that "the chainmakers and their helpers were all good men except so far as pertains to their action in this instance." He concluded that "they acted on the impulse of the moment and they are now mostly out of work, and are no doubt, sufficiently punished to serve the ends of discipline." Since the Civil Service Commission would allow no departure from its regulations, Roosevelt ordered a change in the discharge cards from ratings of "poor" to "good" for conduct, and in January the men were allowed to reregister as smiths and smiths' helpers.[125]

During the World War I years, groups of Boston yard employees threatened to walk out on several occasions, and in one instance work was disrupted in a shop for a few days. However, no genuine strikes occurred. Doubtless, the outcome of the chain shop strike had a restraining effect on workers.

"SERVING THE FLEET"

The volume of its ship work during the years 1900 to 1914 so expanded as to clearly establish the Boston Navy yard as a flourishing industrial enterprise. The number of ships coming to the yard for repairs steadily increased each year, from twenty-six in 1900 to forty-two in 1914. During the most active year, 1912, the yard, at one time or another, worked on forty-eight different vessels. Frequency of dry-docking also increased, from twenty-three in 1900 to sixty-one in 1914. Altogether, the yard

125. Commandant to Secretary of Navy, Nov. 21, 1914 and Dec. 16, 1914; Civil Service Commission to Secretary of Navy, Jan. 14, 1915; Assistant Secretary of Navy to Commandant, Jan. 16, 1915, all in 181-39, Box 173 (1914), #159.

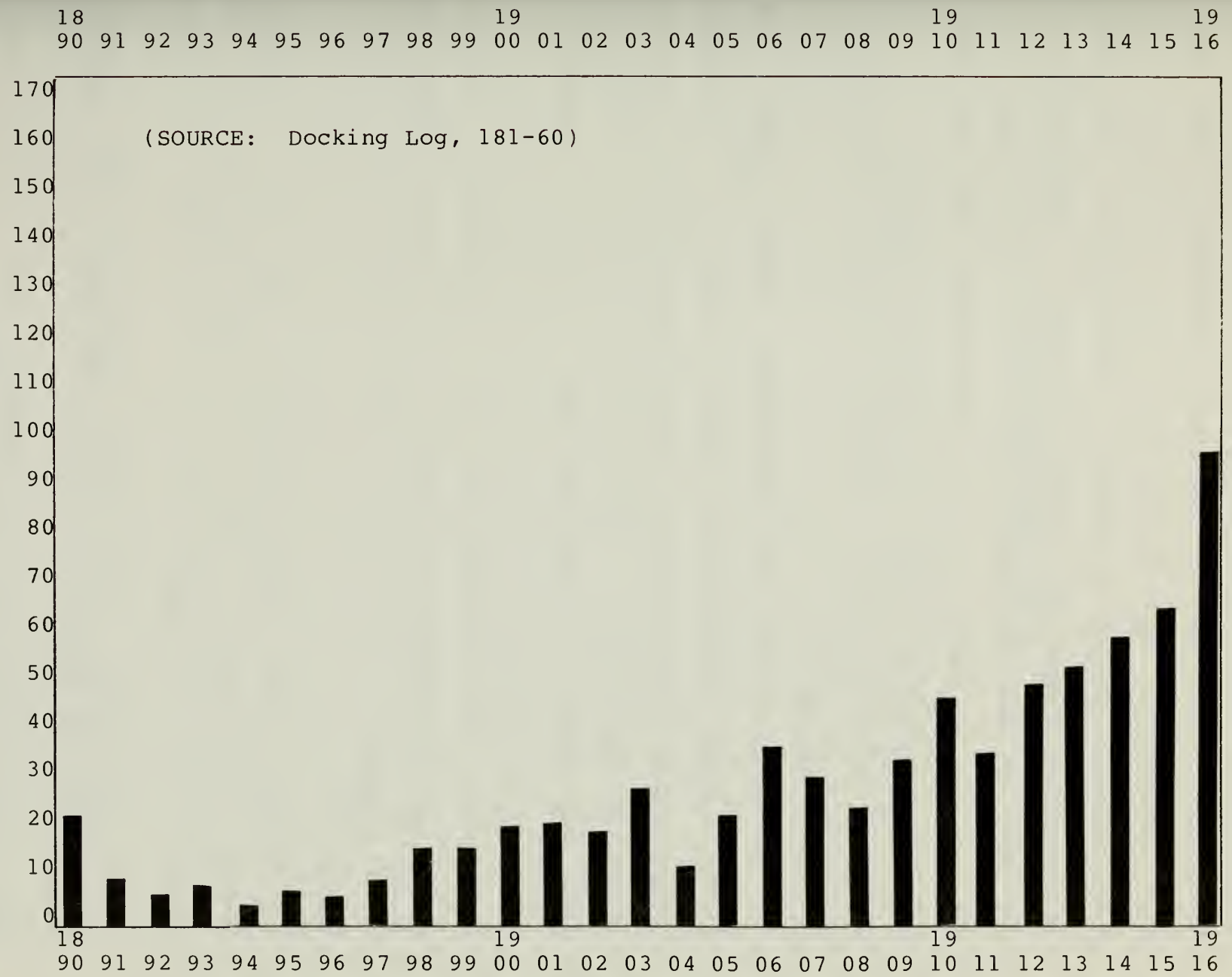
worked on 180 different ships during the first fifteen years of the twentieth century, not counting barges, lighters, caissons, and private vessels. The mixture of types of ships under repair changed in an important respect. In the period 1900 to 1903, more colliers, supply ships, tugs, lighthouse tenders, training ships, and other auxiliaries and noncombat vessels were serviced than warships. By the end of the period, warships outnumbered all other types combined. For almost a decade prior to World War I, the Boston yard regularly repaired battleships, cruisers, and destroyers.[126]

The completion of Dry Dock No. 2 significantly affected repair activities in the yard. Previously, the arrival of a battleship constituted a rare event. However, during 1906, the year the new dock entered commission, the yard repaired no less than thirty-nine vessels, including eleven battleships. Nine of the battleships entered Dry Dock No. 2. The sheer size of these vessels required substantial increases in the work force. And during the period, even bigger battleships were constructed. The largest vessels repaired at the yard prior to World War I were the two Florida-class dreadnoughts, Florida and Utah, both measuring 521 feet, six inches in length, with beams of eighty-eight feet.

The geographical location of the Boston Navy Yard had some influence on the presence of particular ships for repairs, outfitting, or commissioning. Ships assigned to the Newport

126. Information about the volume of ship work at the Boston Navy Yard, 1900-1914 is provided in the yearly volumes of ARND; in the Docking Log, 181-60; and in scattered records about particular ships.

Table No. 4: TOTAL VESSELS DRY-DOCKED BY YEAR, BOSTON NAVY YARD, 1890-1916



Torpedo Station were frequently ordered to the Boston yard for work. Two factors had a bearing respecting vessels newly constructed. One was the location in the region of two large ship contractors, Bath Iron Works in Maine and the Fore River Ship and Engine Company in Weymouth, Massachusetts, later known as Fore River Shipbuilding Company of Quincy. Ships built for the Navy at the Bath and the Fore River plants often were assigned to the Boston yard for commissioning and outfitting. Another geographical factor was the yard's proximity to the waters off Rockland, Maine, regarded as the best trial course in the United States.[127]

In 1906, the New York Shipbuilding Company, Camden, New Jersey, sought permission to dock at Boston the battleship Kansas, which it was building. The contractor claimed "there are no docking facilities for her on the Delaware River." This was true, since Boston's Dry Dock No. 2 was the first to be completed of the docks authorized at the same time by Congress. However, it appears that the company also had in mind Boston's location respecting the Rockland trial course, within a day's cruise and where Kansas was scheduled for her standardization and endurance trials.[128]

During several month-long periods of the early twentieth century, Dry Dock No. 2 was in continuous service, and the proposed visit of Kansas came at such a time. New York

127. John La Dage, Modern Ships: Elements of Their Design, Construction and Operation (Cambridge, Maryland: Cornell Maritime Press, 1953), p. 361.

128. New York Shipbuilding to Commandant, Oct. 12, 1906, 181-16, Box 17, vol. for Oct.-Dec. 1906, pp. 150-1.

Table No. 5: DRY-DOCKINGS, BOSTON NAVY YARD, 1900-1913, BY SHIP AND VESEL TYPES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13
Battleships	0	0	0	0	0	3	13	10	0	7	8	16	13	10
Cruisers	1	2	3	3	3	2	7	5	11	8	4	5	5	2
Destroyers	0	0	0	2	1	0	0	0	0	4	2	7	15	14
Submarines	0	0	0	0	0	0	0	0	0	0	6	0	1	0
Gun & Torpedo Boats	7	5	6	6	2	3	2	1	1	2	2	3	0	1
Monitors	1	0	1	1	0	0	0	0	0	0	0	0	0	0
Colliers	2	1	0	1	0	0	0	0	2	0	3	0	1	1
Transports	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Supply	0	0	2	1	0	2	1	2	1	0	2	1	2	2
Training	8	2	4	3	1	2	4	3	1	3	0	3	2	0
Misc. Navy	0	5	1	3	2	9	2	2	2	2	3	0	0	0
Yard Craft	4	7	4	8	3	4	6	6	6	7	16	5	8	18
US Treasury	0	0	0	0	0	0	1	1	1	1	2	1	1	2
Lighthouse	0	0	0	0	0	0	1	0	0	0	0	0	1	3
US Army	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Commercial	0	0	0	1	0	0	1	1	2	1	3	0	1	1
DD No. 1	23	22	21	29	12	23	24	13	13	16	27	20	30	26
DD No. 2	--	--	--	--	--	2	15	18	14	19	24	21	22	30
TOTALS	23	22	21	29	12	25	39	31	27	35	51	41	52	56

(SOURCE: Docking Log, 181-60)

Shipbuilding suggested docking the vessel in the morning of December 6, 1906. For roughly the same time, another contractor, Fore River, had engaged the dock for Vermont, and the Navy planned to use the same facility for three battleships already in commission. Rhode Island was the Navy's most immediate concern, since she had orders to join the fleet in early January. The Bureau of Construction and Repair, responsible for use of the dock, worked out a schedule for all of the vessels, only to have it thrown off when New York Shipbuilding sought several days' delay in the arrival of Kansas. Battleships could not be moved in and out of dry dock immediately following one another, because it generally took a day to readjust the keel blocks in the floor of the dock. Moreover, it was almost essential that ships of the size of Kansas, Vermont, and Rhode Island be docked and undocked when the tide was at its highest. The Bureau of Construction and Repair produced a revised schedule, and between November 16 and January 9, Dry Dock No. 2 received in fairly rapid succession New Jersey, Vermont, Kansas, Illinois, and Rhode Island. Since New York Shipbuilding was paying for the docking of Kansas, the commandant approved overtime work, "as tidal conditions will make it necessary."[129]

Not surprisingly, warships and auxiliaries regularly serviced by the Boston Navy Yard were attached to whatever organization of ships the Navy maintained at that time in the

129. See endorsements to letters from New York Shipbuilding, Oct. 24 and 25, 1906; Naval Constructor to Commandant, Nov. 6, and Nov. 15, 1906, all in 181-16, vol. for Oct.-Dec. 1906, pp. 152, 272-3, 357; Docking Log.

Atlantic. Other vessels in the yard only once or sporadically were often being sent to or detached from that organization. In 1903, the North Atlantic Squadron became the North American Fleet. That fleet included many of the Navy's newest vessels and consisted of a battleship squadron, a Caribbean Squadron, and a Coastal Squadron. Other units of the Navy's organization afloat were the South Atlantic, European, and Pacific Squadrons, and the Asiatic Fleet. As of January 1, 1906, the Atlantic Fleet came into being, made up of three squadrons, each with two divisions. Squadrons increased in size and number as new ships joined the fleet. Components of the Atlantic Fleet originally consisted of different types of vessels. Modern fleet concepts appeared in an important reorganization in 1913, with the introduction of "forces," subdivisions made up of vessels all of the same type.[130]

Fleet organization had importance for navy yards since it affected the ebb and flow of repair activity. The 1913 organization was intended, among other things, to spread repair work more evenly throughout the year. This was to be accomplished by designating a particular navy yard as the "home yard" for an entire battleship division of five vessels. The concept of having a home yard for every ship was first advanced by the Secretary of the Navy in 1905. He argued that that arrangement would result in more efficient repair work, since reports and documents covering a ship's entire history could be collected at her yard. Moreover, ships' crews would benefit,

130. Furer, pp. 173-4.

because they could make permanent arrangements in that port for their families. Except for informal home yard assignments, nothing came of the recommendation until the reorganization of the fleet in 1912 and 1913.[131]

Most ships worked on by the Boston Navy Yard came for the purpose of being repaired. Repair work, the major function of navy yards, covered the gamut from incidental servicing and routine docking to major overhauls and modernization. Freshly constructed ships arrived to be commissioned and outfitted. Private contractors built most of the Navy's new ships, construction being a secondary function of navy yards. During the period, the Boston yard completed construction of several vessels started elsewhere and built a few small ships in their entirety.

The largest repair job the Boston Navy Yard performed on a single ship during the early twentieth century was modernization of Olympia in 1900 and 1901. Built between 1891 and 1895, the cruiser achieved fame as Commodore Dewey's flagship in the Battle of Manila Bay in May 1898. Following that engagement, the ship had remained in the Far East for a year, before returning to the United States by way of Suez. Arriving in Boston in October 1899, the vessel was out of commission for more than two years.

Repair, overhaul, alterations, and improvements performed at the Boston Navy Yard on Olympia cost roughly one-third of a million dollars. The work included lifting gun turrets and overhauling rollers, roller paths, and gears. Where required,

131. ARND, 1905, p. 380.

PHOTOGRAPH NO. 5: USS Olympia at the Boston Navy Yard, late 1899, while being decommissioned prior to lengthy overhaul.

parts of the decking were renewed. In connection with the redecking and other repairs, wooden joiner parts were replaced with metal to minimize damage in the event of fire. Other major alterations and improvements involved the elimination of the forward and broadside torpedo tubes and the substitution of electricity for steam power in operating the turrets and ventilating blowers. Electric motors were installed in the ammunition hoist systems. Additional work by the yard consisted of altering coal-handling apparatus, building a new signal bridge and house, installing a main shaft manufactured by the Steam Engineering Department, and mounting new bow and stern ornaments.[132]

Olympia reentered commission in January 1902 and shortly thereafter became part of the North Atlantic Squadron. All did not go well for the cruiser following the work at Boston. In his report to the Secretary of the Navy in 1902, the squadron commander stated: "The Olympia joined the fleet in April, but had to spend two months since then at a navy yard, though just commissioned and having been thoroughly overhauled and repaired." For those additional repairs, the cruiser went to the New York Navy Yard.[133]

Vessels newly constructed by private ship yards often required considerable work at navy yards before being ready for duty at sea. In 1906, contractors completed four of the five Virginia-class battleships, authorized by Congress in 1899 and

132. ARND, 1901, pp. 827-8.

133. ARND, 1902, pp. 463, 667.

1900. Fore River Shipbuilding constructed Rhode Island and New Jersey, and Bath Iron, Georgia. The Boston Navy Yard received the three ships, commissioned and outfitted them, served as the base from which they conducted their trials, and did the work necessary to make the ships ready to join the fleet.

Assembling and installing the outfits for a 15,000-ton battleship and collecting and storing provisions for her crew of more than 800 men were sizeable undertakings. Providing for three such vessels at the same time represented an enormous task. Much of the Boston yard's activity from late 1905 into 1907 focused on preparing Rhode Island, New Jersey, and Georgia for active service. Considerable work had to be done to the ships themselves, especially in connection with ordnance. Gathering outfits began in 1905. During 1906, each of the three ships was dry-docked twice, once for two or three days before commissioning and again for a longer period after. The second docking of New Jersey lasted six days, and the work consisted of routine cleaning of the bottom, applying two coats of paint, overhauling sea valves, and calking rivets and butts in the bottom plates where needed. During her second docking, Rhode Island remained nineteen days, in part because of repairs to the plant of four 21-inch submerged torpedo tubes.[134]

Alterations, installations, and repairs found necessary in the first of the three battleships to come to the yard, Rhode Island, were essentially duplicated in the others. The several

134. ARND, 1905, p. 576; Naval Constructor to Bureau of Construction and Repair, Nov. 6, 1906, 181-16, Box 10, vol. for Oct.-Dec. 1906, p. 169.

yard departments determined the work to be done and the number of days required. The work included the following installations: automatic shutters in turrets, forty-five days; coaling derricks, thirty days; submerged torpedo plant, sixty days; electrical devices in broadside turrets, thirty days, and in superimposed turrets, seventy days; and wireless telegraph room, thirty days. Steam Engineering work on New Jersey required fifteen days, and Construction and Repair needed forty-five days for fitting a sewage ejector system, rebuilding the galley drains, and installing lockers in the dynamo rooms. Much of the work could be carried on simultaneously, but, especially respecting guns and turrets, some installations had to await others. That the cognizance of Construction and Repair, Ordnance, Steam Engineering, and Equipment all included work on turrets doubtless delayed those repairs. Defects requiring the attention of the contractors ranged from faulty deck calking in New Jersey to improperly placed spongers and rammers in Georgia. The most serious defect was interference in turrets of New Jersey.[135]

Something of a crisis developed in late 1906, when it became clear that the yard could not complete the battleships in time for them to join the fleet in mid-January 1907. The captain of New Jersey sought to have his vessel remain at the yard until all work could be finished on the turrets. At first, yard officers

135. No comprehensive single statement of work on the three battleships has been discovered. As examples of documentation of particular jobs, see reports of Naval Constructor to Commandant, Oct. 12, Oct 13, Oct. 16, Oct. 22, Oct. 29, Nov. 3, Nov. 5, Nov. 6, Nov. 10, and Nov. 13, 1906, all in 181-16, Box 17, vol. for Oct.-Dec. 1906, pp. 13, 20, 25, 67-69, 138, 200, 243, 258, 269, 271, 320, 338.

favored that course, advocating overtime and Sunday work, but they later changed their view and recommended allowing the ship to sail on schedule and arranging a return to the yard at a future date for further repairs. The naval constructor stated that that arrangement "will have the added advantage of avoiding a heavy lay off in the middle of January which will otherwise result if overtime work in this department be continued." The Department of the Navy agreed, and the three battleships sailed in early January. By that time, Rhode Island had continuously been in the yard for a year, except for her trials and shakedown cruises.[136]

The Boston Navy Yard's endeavors with the three battleships in 1906 exceeded the work performed in connection with other newly constructed ships. During the period 1900 to 1914, the yard commissioned, outfitted, and repaired forty other vessels being added to the Navy, including four more battleships, seven cruisers, eighteen destroyers, seven submarines, two gunboats, and a monitor. Bath Iron Works and Fore River Shipbuilding built most of these ships.

In connection with work on battleships, mention should be made that in late 1907, the yard repaired Kentucky, Missouri, and New Jersey. Those repairs served to prepare the ships for what became an historic voyage, although at the time yard officers and workmen did not know what lay ahead for the vessels. On orders of President Theodore Roosevelt, sixteen battleships, including

136. Commanding Officer of New Jersey to Commandant, Oct. 10, 1906; Naval Constructor to Commandant, Nov. 11, 1906, both in 181-16, Box 17, vol. for Oct.-Dec., 1906, pp. 207, 338.

the three recently at Boston, departed in December 1907 from Hampton Roads on a cruise to the Pacific Coast. Only after the fleet arrived at its destination, did Roosevelt reveal his full intentions of sending the battleships on a friendly cruise around the world. At the end of the voyage the Navy, navy yard officers and workmen, and contractors could take satisfaction in the fact that none of the vessels suffered significant mechanical failures while circumnavigating the globe.

Because of the advances in weaponry and propulsion systems, improving existing battleships was an unending task. In 1907, the Boston yard undertook the installation of updated fire control systems in Vermont, New Jersey, Missouri, and Illinois. That work, requiring close coordination by the Departments of Construction and Repair, Equipment, and Ordnance, entailed building central stations and substations, equipped with fire control instruments; alterations in crow's-nests; installation of a variety of communications devices, such as voice tubes, telephones, and gongs; and fitting range finders and deflection indicators for guns of various calibers.[137]

Repair of ships dominated the activities of the Boston Navy Yard during the years 1900 to 1914. However, there were also some new construction projects. The yard completed construction of two vessels, the hulls of which were built elsewhere. In July 1899, the 224-foot Chesapeake arrived from Bath Iron Works. At that time, she consisted of "a bare hull with wood sheathing,

137. Commandant to Commander L. R. de Steiguer, Nov. 12, 1907, 181-123, Box 8, "Board Reports," p. 32.

decks and steel bulkheads in place, and having store room below berth deck." During the next nine months, the yard produced a finished, three-masted bark, with auxiliary steam power, a four-inch battery, and electric ammunition hoists. In addition to finishing the decks, masts, bridge, and interior, the yard also worked on the hull, injecting red lead behind the sheathing and recalking, coppering, and painting the bottom. Chesapeake, later renamed Severn, was commissioned on April 12, 1900, and a week later left under tow for assignment as a training ship for Annapolis midshipmen.[138]

The Portsmouth Navy Yard built the 157-foot tender Patapsco. Placed by that yard in partial commission in July 1909, she was transferred to Boston for completion. That work took two years. Fully commissioned in July 1911, Patapsco served as a tender for the Atlantic Fleet.[139]

During the period, the Boston Yard itself completely constructed two ships. The launching of the steel-hulled tug Pentucket in July 1903 was the first activity of that kind in the yard since the wooden Vandalia went down the ways in 1874. Local newspapers applauded Pentucket's "perfect descent" and presented the tug as a demonstration of the yard's capability for ship construction in the age of steel. Regarding Pentucket as the symbol of the Boston yard's reemergence as a facility for new

138. ARND, 1900, p. 724; DANFS, vol. VI, p. 455; Naval Constructor to Commandant, Mar. 1, 1900, 181-16, Box 10, vol. for Feb. 19, 1900-Aug. 3, 1900, p. 17; Naval Constructor to Commandant, Dec. 20, 1900, 181-16, Box 11, vol. for Aug. 3, 1900-Jan. 24,1901, p. 426.

139. DANFS, vol. V, p. 724.

construction was not entirely an exaggeration. Completed at the end of the year, she left in January 1904, only to return shortly thereafter to have an engine cylinder renewed. In May 1904, the tug again sailed, commencing her thirty-five-year-long career in various harbors of the North Atlantic coast.[140]

In January 1903, construction began on a second vessel, Training Ship No. 1, Cumberland, which had a water line length of 178 feet, a beam of forty-five, and a draft of sixteen. Sponsored by the daughter of the Secretary of the Navy, the ship was launched in August 1904. Cumberland, built as a steel sailing ship for training purposes, could accomodate 340 men and had a battery of four-inch, four-pounder, and one-pounder guns. Lack of funds delayed completion for three years. Commissioned in July 1907, Cumberland was towed from Boston to the Naval Training Station at Newport.[141]

The yard's next involvement in new construction did not come until the World War I era. In the meantime, repair of vessels continued as the most important function. By a general order of the Navy of March 1, 1915, the Boston Navy Yard served as home yard for forty-six ships. Numerically, among the nation's eight navy yards, this was the third largest assignment, being behind New York (68) and Norfolk (53) and ahead of Mare Island (44), Charleston (37), Philadelphia (29), Puget Sound (27), and Portsmouth (22). The ships based on Boston consisted of five

140. Boston Globe, Jul. 17, 1903; article in unknown newspaper, Jul. 13, 1903, both in 181-83; ARND, 1903, p. 824; ARND, 1904, p. 696.

141. DANFS, vol. II, p. 215; ARND, 1906, p. 573; ARND, 1907, p. 577.

PHOTOGRAPH NO. 6: USS Pentucket, January 20. 1904, prior to departure from the Boston Navy Yard. The tug was the first steel-hulled vessel constructed by the yard.

battleships; four cruisers; sixteen destroyers; two torpedo boats; six submarines; three tugs; five school, training, or militia ships; a torpedo testing craft; a repair ship; a tender; a gunboat; and Constitution.[142]

In actuality, a number of the ships assigned to the yard did not regularly appear for repairs. All six submarines and nine of the destroyers were new vessels being built elsewhere, and not yet completed. Three of the training, school, and militia ships were stationed on the Great Lakes, and work on them would doubtless be done by private firms under contract with the Navy. In effect, the Boston Navy Yard was home to only twenty-eight vessels, including Constitution. Among other considerations were the ages of the vessels. The New York Navy Yard was assigned six of the most recently completed battleships. All five of Norfolk's battleships and five of the sixteen assigned to Philadelphia were newer than the five for which Boston was home yard.

When a lack of work led the Boston yard to furlough and discharge workers in the second half of 1913, the head of the Hull Division linked the layoff to the age and status of the vessels assigned to the yard. He contended that "the five vessels of the New Jersey class, upon which the yard relies for the bulk of its work, are of such antiquated type that it is the policy to restrict repairs and alterations to them to the least possible amount...." Furthermore, other vessels attached to the yard "are of an inactive class so far as repairs and alterations

142. General Order No. 137, Mar. 1, 1915, in General Orders of Navy Department, 1913-1917 (Washington: Navy Department, 1917).

are concerned." The final point of the construction officer held that "many vessels which are assigned to this yard seldom or never visit." He observed that "this is notably the case with the submarines and the scouts."[143]

Fleet commanders, with the approval of the Navy Department, decided when fighting ships went to their home yards for routine docking, repairs, and overhauls. The arrival and departure of its battleship division or of single ships therein as well as the coming and going of the destroyer flotilla were major events in the operations of the Boston Navy Yard. Beginning in 1912, battleships of the Atlantic Fleet were divided into four divisions of five ships each. Each division was assigned to one of the major yards on the East Coast: First Division, New York; Second, Norfolk; Third, Boston; and Fourth, Philadelphia. Entire divisions visited their respective yards during periods devoted to dry-docking and during the end-of-year holidays. Overhaul schedules called for one ship in the division to be at the yard at any one time, the other four being at sea.

For example, on April 1, 1912, the Navy Department published a schedule for the eleven and one-half months stretching from April 15, 1912, to March 31, 1913. That schedule provided for two two-week docking periods and four overhaul periods, usually three months in duration. No fleet or division maneuvers occurred during the docking periods, since all vessels were to be in their home yard, and roughly half of them slated to be dry-docked. During each of the overhaul periods, four of the Navy's active

143. Actual and Prospective Work at the Boston Navy Yard, Oct. 1, 1913, 181-39, Box 133, #16.

battleships would be in their respective yards, and the remaining sixteen would engage in fleet or division exercises, including making passage to Guantanamo Bay.[144]

In 1912 and 1913, the Third Division, for which the Boston Navy Yard served as home yard, consisted of New Jersey, Georgia, Rhode Island, Virginia, and Nebraska. The schedule called for the docking of Georgia, New Jersey, and Rhode Island during the period April 15 to April 30, 1912. Also, Virginia would begin her overhaul at the yard. The fifth vessel in the division, Nebraska, would visit the yard, but not for docking or repairs. On May 1, the division, except Virginia, would begin a series of exercises off New England. This type of scheduling prevailed during the remainder of the period to March 15, 1913, with the yard always having one battleship undergoing overhaul, and with all vessels periodically in the yard, during which some of them would enter dry dock.

The 1912-1913 Navy Department schedule essentially provided for a fifteen-month cycle for each battleship, made up of twelve months on duty, followed by a three-month overhaul. During the year prior to overhaul, the vessel would be dry-docked at least once. Having one battleship under repair at all times was agreeable to navy yard administrators and employees, since it constituted a constant demand for work by repair shops.

Given the natures of men and machines, it is no surprise that the neatly structured 1912-1913 schedule was not strictly

144. Schedule of Overhaul and Docking Periods, Battleships of the Atlantic Fleet, 1912-1913, Apr. 1, 1912, 181-39, Box 103 (1912), #1999-A.

adhered to. Repairs to Virginia in the spring lasted longer than allowed, and Nebraska arrived for lengthy, unscheduled work. Moreover, President William Howard Taft, facing a difficult reelection contest in the fall, ordered a fleet mobilization at New York in October to bolster his sagging political circumstances. All five vessels of Division Three and other ships assigned to the Boston yard participated in the mobilization, which disrupted the repair program.[145]

At the beginning of 1915, the Atlantic Fleet included, in addition to the four divisions of battleships, a squadron composed of armored cruisers and gunboats, a destroyer flotilla of seven divisions, and a submarine flotilla of four divisions. All of the Boston-based cruisers were light or unarmored, and thus not included in the fleet's cruiser squadron. In fact, three had been placed in reserve commission, Chicago being assigned to the Massachusetts naval militia and Chester and Salem alternating as the Boston yard's receiving ship. Birmingham was with the fleet, acting as tender and flagship in the destroyer flotilla.

Next to the battleship division, seven destroyers were the most important fighting ships based on the Boston yard. Six were part of the Atlantic Fleet's destroyer force: Ammen, Downes, Burrows, Patterson, Paulding, and Trippe. The seventh destroyer, Duncan, was out of commission. Especially, Ammen, Patterson, and Trippe traveled as a pack. For example, at the end of June 1914

145. Schedule of Overhaul and Docking Periods, 1912-1913; List of Vessels to Attend Mobilization at New York, Sep. 16, 1912, 181-39, Box 103, #1999-A.

and again in the middle of the following December, they all were simultaneously docked in the Boston yard's Dry Dock No. 2.[146]

During the three years before the outbreak of war in Europe, ship repair work at the Boston yard appears fairly constant from one year to the next, although there were some slack periods. In fiscal year 1914, the yard made minor repairs on twenty vessels and important repairs on twenty-one others. Included among the ships repaired were all those assigned to the yard by the order of March 1915, except the new ships not yet completed, the Great Lakes training vessels, Constitution, and five others. On the other hand, repairs were made on thirteen naval vessels not with Boston home yard assignments: three colliers, six destroyers, two submarines, a gunboat, and the cruiser North Carolina. In addition, the yard worked on vessels of other government agencies, namely a revenue cutter, lighthouse tender, and three army craft.[147]

The ship work performed by the Boston Navy Yard in 1914 was somewhat less than that of previous years, making necessary reductions in the labor force. Nevertheless, the yard had attained the status of an active naval repair facility. Like all navy shipyards in times of peace, it operated at only about twenty-five percent of its capacity. Events, however, were occurring in Europe which, in the near future, would make great demands on the yard.

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146. Docking Log, 181-60.

147. Hull Division to Commandant, Annual Report for the Bureau of Construction and Repair, Jul. 11, 1914, 181-39, Box 158, #13.

Chapter IV

THE TEST OF WORLD WAR I

In 1910, Secretary of the Navy George von L. Meyer contended: "Navy yards are primarily for war and only incidentally for peace."[1] Although it can be challenged, the statement has validity in stressing that only in wartime does a navy yard operate at its full capacity. The history of the Boston Navy Yard during the Spanish-American War demonstrates that point. Despite inadequate wharfage, the absence of a modern crane, a defective lighting system, the condition of the machine shop, and a single seventy-year-old dry dock, the Boston yard performed more work during that brief contest than in the entire previous decade. So it was in World War I. Although, by the standards of the 1890s, the years 1900 to 1914 were a busy period, what the yard could do did not became clear until 1917. During the decade and a half of peace, changes in the yard had reformed its administration and employee policies and added to and improved its plant. World War I tested those changes, reforms, and improvements.

As in the war against Spain, the United States Navy expanded during the Great War in terms of number of ships and the proportion of vessels in full commission. The fleet swelled through new construction and the acquisition of ships previously in other hands. A larger Navy meant more work for navy yards. World War I resulted in an expansion of the Boston Navy Yard's labor force

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1. ARND, 1910, p. 29.

and activity to proportions unmatched until the eve of the twentieth-century's second great struggle, two decades later.

NEUTRALITY AND PREPAREDNESS, 1914-1916.

The outbreak of the war in Europe in the first week of August 1914 ultimately had profound consequences for the Boston Navy Yard, although it caused no immediate perceptible alteration. Consistent with a policy dating back to the 1790s, President Woodrow Wilson proclaimed American neutrality. Secretary of the Navy Josephus Daniels promptly circulated that proclamation throughout the service. Essentially, the proclamation sought to prevent use of the territories and waters of the United States for military preparations on behalf of nations at war. Belligerent vessels were not expelled or prohibited from American ports, but they were restricted in their activity and warships required to depart after very short stays. It became illegal to be a party to the fitting out or arming of any vessel for military service with a country in the war. Another provision of the neutrality proclamation aimed at prohibiting the use of waters under the jurisdiction of the United States "as posts of observation upon ships of war, privateers, or merchant vessels of a belligerent."[2] The Boston Navy Yard found itself involved in the enforcement of that aspect of neutrality.

Two days after his proclamation, President Wilson formally recommended to Secretary Daniels that he advise all naval officers "to refrain from public comment of any kind upon the

2. General Order No. 113, Aug. 7, 1914, in General Orders Navy Department, 1913-1917.

PHOTOGRAPH NO. 7: Battleships Virginia and Georgia, April 23, 1914, departing the Boston Navy Yard, for Veracruz. Constitution is to the left. The inset is a photograph of Capt. Robert E. Coontz, in command of Georgia.

military or political situation on the other side of the water."[3] Wilson hoped that the American people would also refrain from taking sides. In late 1915, a peculiar circumstance at the Boston Navy Yard was regarded by yard officers as affording the occasion of partisanship by elements in the local population.

When the war in Europe began, Fore River Shipbuilding had under construction a battleship for Chile. That nation offered the unfinished vessel to Great Britain, which immediately accepted and, in exchange, gave the South American republic six submarines then in the United States. Prior to transfer to Chile, the submarines, still British property, were brought to the Boston Navy Yard for safekeeping. The pending arrival of the ships caused apprehension among those responsible for yard security, the Marine Corps commander and the captain of the yard. Apparently they feared some demonstration of anti-British sentiment by the Irish-American community. Several conferences were held to decide on precautionary measures, which included the arming of yard watchmen. The arrival of the submarines and their protracted stay at the yard provoked no incidents, and in July 1917, they were ceremoniously transferred to Chilean officers and crews.[4]

During the two and a half years before America became a belligerent, there was increasing evidence at the Boston Navy Yard of the war in Europe and of the possibility that the United

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3. Special Order, Aug. 6, 1914, 181-39, Box 174, #19.

4. Commanding Officer, Marines, to Captain of the Yard, Dec. 2, 1915, 181-39, Box 212, #117; Boston Globe, Jul. 21, 1917, 181-83.

States could become involved. At the same time the government pursued a policy of neutrality toward belligerents, the belief spread that America might have to take up arms in its own cause, and a military preparedness movement swept the nation in 1915 and 1916. Navy preparedness obviously meant preparing ships, a function of navy yards, but in several other ways the Boston yard anticipated war.

The beginning of hostilities in Europe in August 1914 had little impact on the tempo of activity at the Boston Navy Yard until the early part of 1916. Nineteen-thirteen and 1914 had seen a slight slump in the number of ships repaired at the yard and in the number of workmen employed. The small increase in work in 1915 may have been more of a return to the usual volume of repairs in the early twentieth century, rather than a response to the war abroad. Until the summer of 1916, the yard occasionally reduced its labor force because of lack of work, and yard administrators pleaded with the Navy Department for an increase in repairs or for new construction.

Although a peacetime quality lingered over repair activities, the war and America's existing and future relations with it were manifest in varied ways. In October 1915, for example, the Navy Department, looking forward to the possible demands of war, solicited estimates of the largest number of men that could be employed in the shops of the Manufacturing Department, by then known as the Industrial Department. The commandant reported that the greatest number possible, if organized into one shift was 3218; if two shifts, 6021; and if

three, 8220.[5]

During the following year, there were other efforts to look ahead. The Navy earmarked certain private vessels to be taken over by the government in time of war. These vessels, designated as "C Fleet," would be directed to preassigned navy yards for conversion or fitting out. For the yards to render that service expeditiously, it was important that they know in advance something about the ships and what the Navy intended to use them for. In April 1916, the Boston yard received notice of the assignment of five specific merchantmen of C Fleet. In the Spanish-American War, the Boston yard had engaged private ship repair firms to work on vessels of the Navy, and doubtless the next war would see a repetition of that practice. Accordingly, during the neutrality period, the yard collected information about the existing and projected facilities at six companies in the area.[6]

For the Supply Officer, formerly the General Storekeeper, preparedness meant having on hand whatever might be needed by shops and by ships basing on the yard, including food provisions. "Under ordinary conditions," the Supply Department carried 1,500,000 pounds of tinned and preserved rations, the quantity being more or less determined by the available storage space. The prospect of war and of ships hastily sailing for distant

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5. Commandant to Bureau of Construction and Repair, Oct. 6, 1915, 181-39, Box 212, #15.

6. Bureau of Supplies and Accounts to Commandant, Apr. 7, 1916, 181-39, Box 291, #19; Commandant to Bureau of Steam Engineering, Dec. 18, 1916, 181-139, Box 293, #19-71.

duty changed matters. Navy regulations required a supply department to have in store rations sufficient for three months for all crews of vessels dependent on the yard for supplies. In 1916, the Boston supply officer calculated that he was responsible for 9800 men, who needed 2,137,044 pounds of provisions. This meant he had to obtain the deficiency and also locate additional storage space.[7]

While the yard was preparing for war, it also played a role in the enforcement of American neutrality. A combination of circumstances -- the location of the yard at a major port and the function of the yard commandant as the commander of the First Naval District -- resulted in the yard performing quasi-military assignments. Those assignments arose in part because of the presence in Boston Harbor of eight passenger and merchant ships flying the flags of nations of the Central Powers.

The control the British fleet exercised over the North Atlantic when the war began led German and Austrian ships in or near American ports to elect to remain at or to return to those ports, safe from seizure by the enemy. The government of the United States came to refer to that act as "self internment." To insure those vessels did not attempt an "illegal departure," the Navy placed a number of its destroyers on "neutrality duty." In January 1916, Paulding and Henley performed that service in Boston Harbor, operating out of the navy yard. On orders of the commandant, one of the vessels was always to be moored at a

7. Supply Officer to Bureau of Supplies and Accounts, May 22, 1916, 181-39, Box 291, #19-4.

"salient pier" of the yard, "bows out" and "steam up," ready to give chase, if required.[8]

In February 1917, the Boston neutrality force consisted of four destroyers, Patterson, Warrington, Jenkins, and Trippe. The ship on "active duty" was to be ready to respond immediately, the "first relief" within an hour, and the "second and third reliefs" within twelve hours. To enforce self-internment and neutrality regulations elsewhere in the First Naval District, arrangements were made with the commandant of the Portsmouth Navy Yard and collectors of customs and commanders of army units along the New England coast to act "as sources of information for the Commandant of the First naval District."[9]

In addition to having destroyers at the ready, the Boston Navy Yard maintained a surveillance of belligerent ships in port. To prevent such ships in American waters from providing information to their governments and navies, President Wilson banned their transmitting and receiving radio messages. Regulations required self-interned vessels to lower radio antennas to the decks, disconnect antennas from radio rooms, and seal receiving and transmitting apparatus.[10] In Boston Harbor, ascertaining compliance with those regulations and other neutrality requirements was assigned to a tug of the navy yard. Acting on

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8. Commandant to Secretary of Navy, Jan. 11, 1916, 181-39, Box 292, #19-6153.

9. Senior Destroyer Captain, Feb. 18, 1917, 181-39, Box 358, #311; Aide to Commandant, Feb. 6, 1917, 181-39, Box 350, #19-6154.

10. Instructions Relating to Enforcement of President's Executive Order, Jan. 6, 1916, 181-39, Box 191, #19-6154.

orders from the captain of the yard, the tug master made a daily inspection of German and Austrian ships in port and entered his observations in a special log. The vessels were checked to insure that the antennas remained down and no alterations occurred, such as in the draft of vessels, which might indicate preparations for departure[11]

The neutrality force of destroyers and the daily inspection of German and Austrian passenger and merchant ships involved only a few of the officers and employees of the Boston yard. Larger numbers later became intimately acquainted with several of the self-interned ships when, after the United States entered the war, they were confiscated and converted for service in the American navy.

Once American participation in the war became imminent, several changes occurred in the Boston Navy Yard. In February 1917, a gate pass system went into effect to regulate entry into the yard. Previously, except for prohibitions against visitors during the Spanish-American War, no formal, permanent system prevailed. A wall surrounded the yard, and marines manned the gates, so that some controls existed respecting those entering the facility, but it took the pressure of a major war to institute a regular and ongoing system.

A gate pass procedure had existed very briefly in 1909. Two years earlier, Naval Constructor Elliot Snow recommended issuing brass checks or tags to each civilian employee, bearing his name

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11. Captain of Yard to Chief Boatswain, Feb. 23, 1916, 181-39, Box 292, #19-6154.

and the initials of his department. The necessity of exhibiting such a check at the gate would prevent "outsiders" from passing themselves off as workmen and entering the yard "to smuggle liquor or perhaps do petty thievery." Another consideration also prompted Snow's proposal. A number of instances had been brought to his attention of workmen "loafing or not diligently carrying on their work on vessels in commission." Officers of those ships had no way of reporting specific culprits, since they could not be identified. Snow's system of checks would facilitate cracking down on both loafers and undesirable visitors. The recommendation of the naval constructor was accepted neither in 1907 nor in 1908.[12]

However, the Newberry scheme of organization elevated Snow to the position of manager of the Manufacturing Department. With his greater influence, he obtained the commandant's approval for an identification system, which went into operation on April 1, 1909. That system required each employee to select a particular gate through which he would enter and leave the yard. When arriving in the morning, he would find his tag hung on a board at the gate. Taking up his tag, the workman would retain it for identification during the day and deposit it in a box at the same gate upon departing the yard. That arrangement seemed to have additional benefits, such as rapid determination of absentees. However, according to the Marine Corps commander, "extreme confusion and disorder" reigned on the first day of the

12. Naval Constructor to Commandant, Sep. 19, 1908, 181-33, Box 59, vol. 80, p.78-A.

new system. Checks had not been hung on the boards in any sequence, and some were located at the wrong gate. Entrances became clogged with bewildered workmen and sentries.[13]

The innovation was soon abandoned in practice, although not officially revoked until September 1911. Thus when the war began in Europe, there existed no system of gate passes or for identifying workers. As a precaution against theft, Commandant Rush in December 1914 directed attention be given to development of a workable system of badges. In the following August, foremen and other supervisory workmen began to wear metal badges, a practice soon extended to other manual laborers, but not office employees. Instructions in 1916 directed Marine Corps sentries to prevent entrance into the yard of certain categories deemed undesirable: "women of questionable character," "Italian laborers," and dogs, except "those on leash or belonging to officers living in the yard." No packages or bundles could be brought out of the yard without authorization, except those of officers, members of their families, and their servants or orderlies.[14]

On February 1, 1917, a gate pass system for yard personnel went into operation. Passes of different colors were issued to various groups, depending on their status and the hours necessary for them to be in the yard. All who entered the yard were required to have a pass. In addition, workmen continued to wear

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13. General Notice No. 11, Mar. 29, 1909; Commander, Marines, to Commandant, Apr. 2, 1909, both in 181-39, Box 19, #3701.

14. See attachments to Memorandum for Commandant's Aide, Dec. 12, 1914, 181-39, Box 159; Orders for #4 Gate, n.d., 181-39, Box 213 (1916), #1176.

metal badges while on the job.

YARD ADMINISTRATION IN WARTIME

Some administrative changes involving the Boston Navy Yard occurred in the World War I years. One change was the invigoration of the naval district system, which had been little more than a paper organization from 1903 to 1914. The system began to acquire importance with the outbreak of war. Of particular significance for the administration of the Boston Navy Yard was the transfer in February 1915 of the command of the First Naval District from Portsmouth to Boston, making Capt. William Rush both yard commandant and district commandant. The First Naval District included the area between Eastport, Maine, and Chatham, Massachusetts. The switch from Portsmouth to Boston involved no transfer of personnel, only of files. As commandant of the First Naval District in 1915 and 1916, Rush had responsibility for directing the neutrality patrol, harbor defense, and other military matters.

Soon, the naval districts grew to include all Navy shore establishments. Command of a district began to require greater attention than could be provided by a single officer, who was primarily concerned with a busy ship repair facility. As early as 1915, a navy board recommended appointment as district commandant of an officer with no other duties, and on two

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15. Useful in tracing the developments respecting gate passes and identification practices is a typed document with penciled headings "History of Passes" and "about Nov. 1925," P.F.W., Memorandum, n.d., 181-40, Box 2 (1925), A2-14. See also General Order No. 25, Oct. 26, 1917, 181-39, Box 339, #117.

occasions in 1916, Rush requested the Navy Department provide him with an aide specifically to handle district affairs.[16]

Utilizing officers from the yard and other Boston-area Navy units and officers provided by the Navy Department, Rush developed a district staff. Because of the early emphasis in district affairs on military matters, as distinct from industrial, the yard officer traditionally having a military role was linked with the new organization. That was the captain of the yard, who in the years before 1917 was Lt. John Hilliard. During the formative stage of the district office, Hilliard played a prominent part, and as "aide" to the district commandant, was second in command in the district as well as in the yard. Hilliard urged the physical separation of district headquarters from the Boston Navy Yard "in the same manner as it is from the Navy Yard, Portsmouth, N.H." This was necessary, according to Hilliard, because "the present system is merely makeshift and inefficient, and is the occasion of more or less confusion...."[17]

The First Naval District staff grew rapidly and, in the summer of 1917, included the commandant, his aide, a chief of staff, a naval force commander, and eight commanders of geographic "sections." Besides Rush and Hilliard, several yard officers appeared on the roster of the district. For example, Cdr. Frank Lyon, head of the yard's Machinery Division, became the District Engineer Officer, and Naval Constructor William

16. Commandant, First Naval District to Secretary of Navy, Dec. 14, 1916, in Fifty Years of Naval Districts, p. 69. Also, see p. 15 of that volume.

17. Aide to Commandant, Apr. 17, 1917, 181-39, Box 334, #11.

Baxter, head of the Hull Division, District Construction Officer.

A greater distinction emerged between the yard and the district, when the district office moved early in 1918 to a location in Boston and when the yard commandant no longer commanded the district. General orders of the Navy Department in February gave district commandants "full military control and authority over the various activities of the Navy within the district...." Those activities were "segregated" into four groups: military, industry, supply, and transportation. District commandants were not

> required to supervise the technical work or administrative detail of the several groups, but will operate each through an officer who shall act as executive chief in the group to which he is assigned....

The order also stipulated that certain activities hitherto carried on or associated with navy yards and having no relation to industrial work would be removed from yard organizations and placed under the appropriate district group. Such activities included receiving ships, marine barracks, naval hospitals, and ordnance ammunition depots.[19]

As those orders were implemented by Rear Adm. Spenser S. Wood, the new First Naval District Commandant, Captain Rush became "Chief of Industry" and head of the Industrial Group of the First Naval District. That group included the Boston and Portsmouth Navy Yards and other industrial operations, such as

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18. Memorandum of the Commandant, Jun. 29, 1917, 181-39, Box 334, #11; List of Officers, Boston Navy Yard and First Naval District, Aug. 15, 1917, 181-39, Box 340, #13.

19. General Order No. 372, Feb. 28, 1918, 181-39, Box 433, #11.

Navy repair work done in private yards. Rush's primary billet continued to be commandant of the Boston yard. Respecting Portsmouth, the Chief of Industry had the "duty to be familiar with work in progress there...."[20]

The development of the district system during World War I involved the Boston Navy yard organizationally, but not functionally. With respect to its industrial work, the yard continued to receive orders directly from and to correspond directly with the Navy Department in Washington, and it functioned independent of the First Naval District. Similarly, the Portsmouth yard retained its own commandant and was not a subordinate unit of the Boston yard. The "Chief of Industry" of the First Naval District is a title that appears only in district orders and tables of organization. Some units of the Boston yard were "affiliated" with the district, namely the receiving ship, yard craft, marine barracks, and the heads of the Public Works and Supply Departments. Confusion surrounded the development of the district system, and the relationship between navy yards and other shore establishments with district commandants became "by far the thorniest of all Naval District problems."[21]

Because of the circumstances generated by World War I, it is more than likely that officers responsible for the administration of the Boston Navy Yard gave a low priority to their duties with the First Naval District. At that time, the last thing those men

20. Industrial Group, First Naval District, Organization and Administration, 1918; Location of IND Offices, Boston, n.d., both in 181-39, Box 433 (1918), #11.

21. Industrial Group, First Naval District; Fifty Years of Naval District Development, p. 35.

needed were additional administrative chores. Demands upon them vastly increased with the rocketing of the size of the yard labor force to more than 10,000 employees. Moreover, the volume of work on ships exceeded the capacity of the yard, and the surplus was assigned to private yards in the area. That work had to be supervised and inspected by yard officers. Also, during the war, the Navy acquired a number of sites and facilities in the Boston area that fell under the administrative responsibility of the yard. These included leased storage space at Mystic Dock and Commonwealth Pier; Lockwood's Basin, with its barracks for enlisted men; and a coal storage depot at South Boston.

During the years of World War I, the internal administration of the Boston Navy Yard experienced alterations in style and size, rather than in formal structure. Organizational changes were either temporary or cosmetic. In February 1917, the Navy Department ruled: "the designation `manufacturing department' being a misnomer..., the title of that department is changed to `industrial department.'" Major changes had accompanied the advent of the Manufacturing Department in 1909, but the "Industrial Department" appeared with no administrative alterations whatsoever.[22] Another substitution in nomenclature saw the General Storekeeper's Department renamed the "Supply Department."

After the United States became a belligerent in April 1917, the demand for expeditious handling of a great volume of navy yard work led to cutting administrative corners and to an impatience with what appeared as unnecessary paper work. Most of

22. General Order No. 269, Feb. 10, 1917, in General Orders of Navy Department, 1913-1917.

the practices used to circumvent red tape were informal arrangements. However, one consequence of the desire to simplify procedures was the temporary abolition in the fall of 1917 of the Inspection Department and the assignment of its functions to other units. A few weeks after its disappearance, the department was reestablished. The status of the Inspection Department may have been a matter of contention between the commandant and the naval constructor.[23]

Although retaining its basic organization, the administration of the Boston Navy Yard expanded remarkably in terms of numbers. In March 1915, yard management rested in the hands of twenty-six commissioned and twenty-one warrant officers. By October 1918, commissioned officers had quadrupled, although the number of warrant officers remained the same. Significant increases occurred in the officer corps of the Machinery and Hull Divisions and in the Dispensary. The greatest growth was experienced by the Supply Department, which expanded from five to twenty-nine officers.[24]

Many of the officers in the yard held temporary or reserve commissions, and there was a larger proportion of ensigns and lieutenants junior grade than in peacetime. Line officers needed for duty at sea were relieved by a host of newcomers, some of whom were young or possessed little or no experience. The

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23. Inspection Officer to Commandant, Oct. 26, 1917; Commandant to Heads of Departments, Divisions and Offices, Nov. 22, 1917, both in 181-39, Box 336, #1211.

24. Directory, Boston Navy Yard, Mar. 1, 1915, 181-39, Box 212, #1174; Directory, First Naval District, Oct. 1918, 181-39, Box 438, #13.

additional officers frequently held positions as "assistants" in their divisions or departments, although new titles appeared in response to the increased specialization in ship work and the enlarged work force. For example, in 1918, the Machinery Division included a Fire Control Officer, Radio Officer, and officers in charge of installations of radio telegraphs and radio compasses. The Hull Division had an Injury Officer, and the Dispensary an officer in charge of workmen's compensation matters. The yard's principal officers continued to be those of the prewar period: commandant, captain of the yard, and division and department heads, with the major subordinate posts in the Industrial Department being outside superintendents, shop superintendents, and inside or office superintendents.

At times in 1917 and 1918, the administration of the Boston Navy Yard was understaffed, despite the additions to its roster of officers. Shortly after the United States entered the war, Naval Constructor William Baxter wrote to a friend that "the officers are greatly overworked," with "most of them working ten and twelve hours per day" and "putting in night work." Baxter anticipated some relief when eight reserve officers, recently assigned to the yard, completed their tours of instruction and began active duty. Baxter proved unduly optimistic in his anticipation of an easing of the burden on the yard's officers. The volume of work continued to grow, and the pressure on officers persisted.[25]

That those pressures sometimes led to strained personal

25. W. J. Baxter to L. S. Adams, May 18, 1917, 181-39, Box 345, #15919.

relations was to be expected. Frayed tempers appeared in a serious squabble in late 1917. With the Navy Department complaining about needless delays on the part of navy yards and many young, inexperienced officers in their commands, Commandant William Rush and Naval Constructor Thomas Roberts became embroiled in a bitter controversy.

Rush had served as Ordnance Officer and Inspection Officer at the Boston Navy Yard during the Newberry reorganization in 1908 and 1909. At that time, he demonstrated his doubts about members of the Construction Corps.[26] Subsequently, he became the commanding officer of the battleship Florida, which in April 1914 was anchored with two other American warships off the Mexican port of Veracruz. Mexico's turbulent politics had produced tensions between that nation and the United States. When the Navy received orders to seize the Veracruz customs house, Rush led an armed force of more than seven hundred marines and seamen. Seizure of the customs house resulted in bloodshed and further damage to Mexican-American relations. For his role in the Veracruz incident, Rush received the Medal of Honor. Later in 1914, he became commandant of the Boston Navy yard.[27]

On September 19, 1917, after three years as the superintending constructor at the Fore River plant in Quincy, Thomas Roberts reported to the Boston Navy Yard as construction officer, filling the slot vacated by the capable William Baxter. Within a

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26. See above, p. 182.

27. Robert E. Quirk, An Affair of Honor: Woodrow Wilson and the Occupation of Veracruz (New York: W. W. Norton, 1967), pp. 85ff.

few months of his arrival, a serious antagonism developed between Rush and Roberts. In early December, the naval constructor sent to the Secretary of the Navy a report listing numerous examples of Rush's alleged improprieties and violations of Navy regulations.

According to Roberts, whose report included affidavits by others in the yard, the commandant had employed "reproachful language" toward nine officers, threatening some of them with formal charges, loss of rank, and even prison. As for Roberts himself, Rush on one occasion used the threat of a court martial because of a "misunderstanding" about the docking of two vessels, and in another instance talked of suspending him "for venturing to discuss the abolition of the Progress Section and the Inspection Department." In yet a third incident, the commandant made use of "reproachful and disconcerting language and manner" toward Roberts in the presence of his assistants, causing the naval constructor "humiliation," since Rush's tirade constituted "in its substance a form of public reprimand." Roberts claimed that Rush displayed a similar disposition toward yard workmen, causing several to be arrested and expelled from the yard.[28]

Roberts described the general state of affairs at the yard as "intolerable." The commandant, he wrote, appeared "to have lapses of temperament and speech which are beyond his control." More or less explicitly, Roberts sought the removal of Rush or,

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28. Naval Constructor Roberts to Secretary of Navy, Dec. 9, 1917, 181-39, Box 336, #441-R. For Rush's treatment of workers, see below, pp. 348-52.

failing that, his own detachment.

In an endorsement to the Roberts report, Captain Rush denied none of the charges. Probably an element of the line-staff feud was involved in the poor relations between the two officers, Rush recalling his days defending America's honor at sea and in the streets of Veracruz, while the shore-bound Roberts watched other men build ships.

Rush concluded his endorsement with the request that "for the good of the Navy Yard," Roberts be immediately detached. That in fact was the finale of the episode. Roberts left the yard as of December 24, 1917, less than three months after he had reported.[29] The transfer of Roberts, the mutual animosity between him and Rush, and the other events of the controversy indicate a want of harmony in the yard at least during part of the war. Rush's behavior toward workmen, documented by affidavits in the Roberts report, is a matter of importance and will receive further attention subsequently.

The rapid development of the First Naval District organization introduced a new administrative layer in the operations of the Navy's shore installations. It serves as an example of the bureaucratic mushrooming found in military establishments in wartime. However, on the local or navy yard level, the emergency of war led to an abbreviation of administrative procedures in order to expedite work on ships. At the Boston Navy Yard, means were sought to dispense with or minimize paper work entailed in the repair or outfitting of vessels. Particularly regarded as

29. Data for Annual Report, Aug. 23, 1918, 181-39, Box 438, #13.

somewhat superfluous were the complicated procedures associated with the central office system, introduced into the Industrial Department in 1912.

The Navy Department did not specifically call for "cutting red tape" until November 1917, but previously the department and the government at large sent a message when, in the name of wartime exigencies, they by-passed peacetime restraints and barriers. For example, Congress and the president suspended the prohibition against navy yard employees working more than eight hours a day, and the Civil Service Commission waived provisions requiring yard workers to be employed only in the trades for which they had been particularly hired. Such developments encouraged yard officers to make their own adjustments respecting administrative requirements that seemed to impede the prosecution of work.[30]

In February 1917, Captain Rush "strongly" recommended that the Labor Board no longer screen applicants for positions in the yard, but send them directly to department heads. The commandant also suggested the Labor Board turn over to those heads complete registers and lists and daily inform them of changes to be made in those documents. It appears Labor Board procedures became something of an unnecessary burden when there were more jobs than workmen to fill them.[31]

Planning and estimating, central office functions, were

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30. Secretary of Navy to Bureaus, Offices, Commandants, Mar. 22, 1917, 181-39, Box 435, #15919.

31. Commandant, Special Memorandum, Feb. 4, 1917, 181-39, Box 358, #312.

regarded as the most cumbersome of the procedures for work on ships, and consequently they were reduced during the war years. In June 1917, the heads of the Machinery and Hull Divisions issued a joint memorandum, approved by the commandant, in which they stated: " Planning and estimating section shall curtail all detail work. Explanations of differences between estimated and actual costs are suspended."[32]

Subsequently, Commandant Rush explained his own views. He believed much time could be saved by "avoiding `planning´ wherever practicable," and he defined "planning" as "the laborious use of time and money in making pictures which are not absolutely necessary to the prosecution of work." Rush seemed ready to return to the days before scientific management. Instead of worthless "pictures," he recommended that the officer in charge

> proceed to the spot and in the presence of his master workmen and leadingmen,...delineate with chalk on the actual ship what is to be done, expecting...the master workmen and leadingmen will cover the details of execution with the mechanics themselves.

Taylorites would have been shocked by such a proposal. Rush advocated that officers spend "less time in office work and more in frequent supervision and instructional visits to the work." The captain concluded by informing his officers that "they can, upon approval, disregard the cumbersome correspondence and `red tape´ of peacetime."[33]

In practical terms, wartime procedures did not eliminate

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32. Construction Officer and Engineering Officer, Jun. 25, 181-39, Box 245, #16.

33. Commandant to Construction Officer, Sep. 17, 1917, 181-39, Box 336, #121.

paper work entirely, but reduced emphasis on it and allowed ship work to proceed without formal orders, plans, and estimates. Planning was still necessary to insure the needed materials and manpower would be on hand. But when necessary and practicable, the actual work went forward in advance of written authorization, job orders, auxiliary job orders, and progress sheets. Getting the actual job started as soon as possible received priority. One demonstration of the reformed system occurred when the master joiner directed the removal of part of the interior of Yacona, without any "planned instructions whatsoever."[34]

In November 1917, the Navy Department became concerned with delays at navy yards in fitting out vessels for service, and Secretary Daniels attributed the cause to "adherence to peace-time methods which established high standards of finish and character of work, and to methods of planning and laying out work prior to its commencement." He directed commandants at each navy yard to arrange a general conference of officers to formulate simple rules for work in fitting out, repairing, and altering ships. The Boston yard held such a conference on November 20, and produced a set of guidelines consisting of procedures already instituted by the commandant and division heads.[35]

THE WAR AND YARD FACILITIES

Many of the important additions to or improvements in the

34. Office of the Construction Officer, Nov. 19, 1917; General Procedures of Routing Work under Cognizance of Machinery Division, Nov. 4, 1917, both in 181-39, Box 336, #1211.

35. Daniels to All Commandants, Bureaus, Nov. 7, 1917; Naval Constructor to Commandant, Nov. 21, 1917, both in 181-39, Box 336, #1211.

plant of the Boston Navy Yard and identified with the World War I era appeared in the last year of hostilities or after the armistice in November 1918. With some exceptions, the yard prosecuted its war work with the facilities existing in 1914. That the yard was able to meet the greatly expanded demand resulted from several circumstances. First of all, in 1914, only one-quarter of the yard's ship service and repair capacity was actually utilized. Secondly, during the war, a much enlarged labor force worked two or three shifts, thus doubling or tripling the peacetime use of the plant. Finally, as in the Spanish-American War, work that might have been done in the yard was farmed out to commercial firms under the supervision of the Hull or Machinery Divisions. This proved to be the case particularly with small, private craft being converted to Navy use. That practice enabled the yard to concentrate its energies on warships and large vessels. Thus, the yard and its plant, which repaired forty-two vessels in 1914, could work on 215 in 1918.

The impact of the First World War on the physical plant of the Boston Navy Yard was temporary in some respects and permanent in others. Between 1915 and 1919, thirty-six new buildings were erected. Seven of these were makeshift and impermanent, receiving no numbers in the yard's system for designating buildings. Generally, these were small structures, with metal sides and roofs and concrete floors. One unusual edifice, No. 161, appeared when an old ship's cabin was deposited south of Building No. 42 as a shelter for Machinery Division Officers. Two-thirds of the World War I structures served to provide

storage space, the most pressing need of the yard.[36]

A navy yard commission in 1917 described the storage situation at Boston as "alarming."[37] None of the buildings then existing had been designed specifically for the General Storekeeper's or Supply Department, which had used quarters abandoned by other departments. Under these circumstances, no physical consolidation of stores was possible, and in 1917, the Supply Department occupied fourteen different buildings, or parts thereof, scattered around the yard. The total space provided by these buildings was barely adequate for peacetime. When America became a belligerent, hundreds of ships were ordered outfitted by the Boston yard, requiring the accumulation of vast quantities of equipment, stores, materials, and provisions. Thus, the alarming situation.

Remedies for the shortage of storage capacity consisted of the construction of a large permanent storehouse, the erection of temporary structures, and the renting of space at commercial warehouses in the Boston area. A general storehouse, Building No. 149, was constructed on a site previously occupied by Nos. 63 and 64, both former timber sheds and both damaged by fire. No. 149 was built in two stages. The first, completed in early 1918, produced a six-story structure with dimensions of 185 by 256

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36. Information about the yard's plant is taken primarily from the following documents: AREO, 1916, 181-39, Box 283, #16; Annual Inspection of Public Works, Jul. 7, 1916, 181-39, Box 323, #6; ARND, 1918 (FSS #7495), pp. 428, 429, 660-1; Annual Inspection of Public Works and Public Utilities, Jul. 3, 1918, 181-39, Box 523, #6.

37. Preliminary Report of Navy Yard Commission, 1917 (FSS #7158-1), pp. 46-8.

feet. The second stage provided two additional floors for the original and an eight-story, 185-foot by 180-foot extension. Upon completion of the extension in late 1918, the new facility contained a total of 637,000 square feet of floor space.[38]

Before, during, and after construction of the two sections of Building No. 149, at least eighteen small, temporary storehouses were erected. Still further space resulted in 1917, when the Supply Department leased several floors of Mystic Docks Terminal Warehouse, in Charlestown and to the north of the navy yard. During the following year, nine additional floors at the Mystic Warehouse were required by the Supply Department. That department also obtained space at the Commonwealth Pier in South Boston and at other locations.[39]

Several new and permanent structures were built at the Boston yard in addition to Building No. 149. Also, some existing buildings experienced important alterations. Building No. 153 provided storage for ordnance and later served as a submarine battery charging station. No. 187 was designed as a metal storage facility. The Manufacturing Department acquired an oxy-hydrogen generating plant, Building No. 165, for the production of gas used in cutting steel plates.

Substantial improvements in older buildings included extending the chain shop in Building 105 by utilizing the west end, previously the location of the Construction and Repair power

38. Activities of the Bureau of Yards and Docks, Navy Department, World War, 1917-1918 (Washington: GPO, 1921), p.. 327.

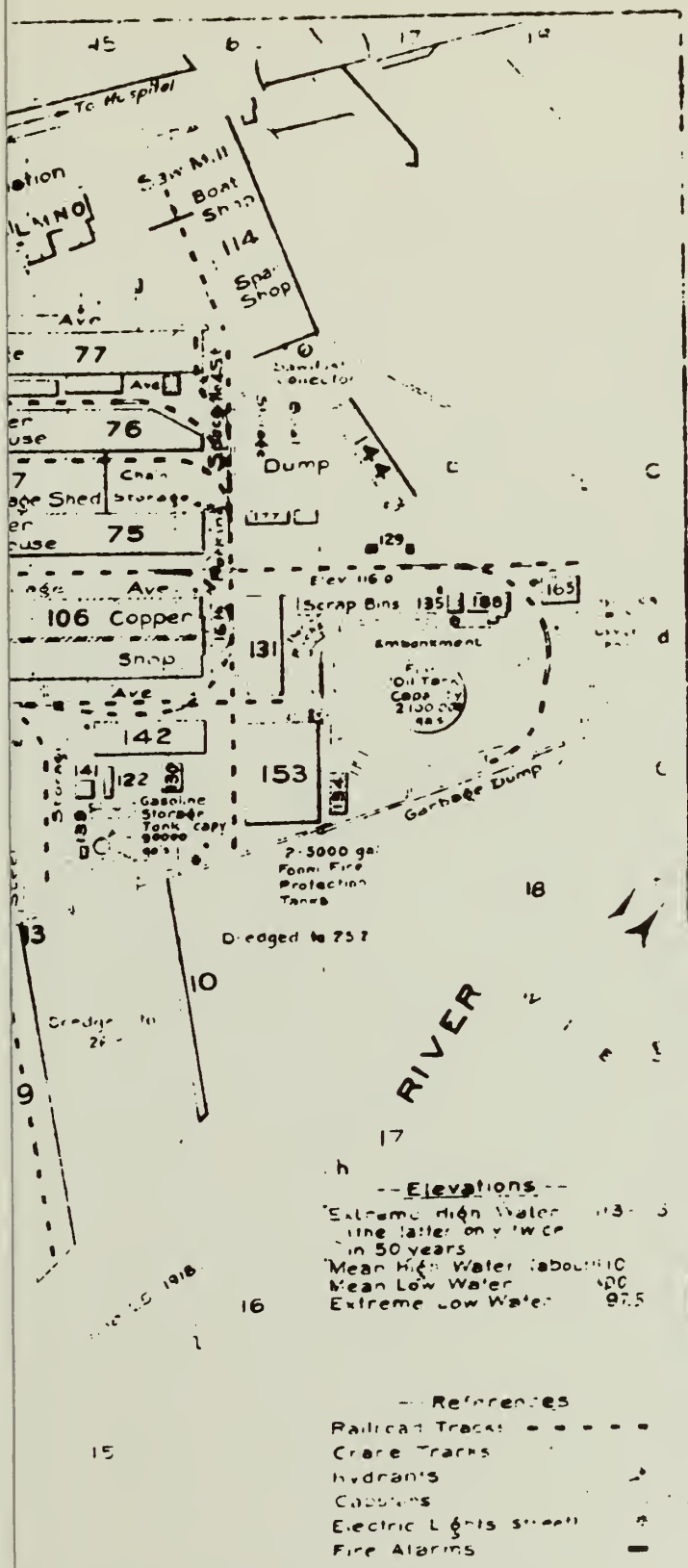
39. Supply Officer to Commandant, Apr. 30, 1918, 181-39, Box 433, #11.

CHART NO. 3: THE UNITED STATES NAVY YARD, BOSTON, MASS.: MAP OF THE YARD SHOWING IMPROVEMENTS TO JUNE 20,1920.

NOTE: Chart No. 3 indicates plant changes at the Charlestown site prior to and during World War I. Improvements in the waterfront include the construction of the marine railway; the addition of Piers Nos. 4A and 10; and rebuilding of Pier No. 9. Among new buildings were the General Storehouse (No. 149) and the Acetylene Plant (No. 165). Most of the structures erected during World War I were temporary, portable buildings used primarily for storage, such as Nos. 146-8, 151, 154-61, 164, and 166-87. Plant expansion in the decade before the war and from 1914 to 1919 saw the elimination of the timber dock or wet basin at the east end of the yard and the construction there of an oil storage tank, battery charging station (No. 153), the acetylene plant, and locomotive and crane shed (No. 144). Note the new bulkhead line of June 25, 1918

Chart No. 3 shows a "Fuel Ship Under Construction" on the shipways between Buildings Nos. 103 and 104. The vessel was Pecos, whose keel was laid on June 2, 1920, immediately following the launching of Neches earlier on the same day. Pecos was launched April 23, 1921.

The map was prepared by Capt. L. E. Gregory, C.E.C. (Civil Engineer Corps) and yard Public Works Officer to accompany his department's annual report. The particular copy here reproduced shows arrangements for an unidentified event, apparently open to the general public. Those arrangements included designation of comfort stations and parking areas and provisions for a number of activities, such as the sale or distribution of refreshments, programs, and souvenirs; "jitney dance and vaudeville," and diving exhibition or demonstration (Pier No. 2). The event may have been organized by the local Navy League unit to mark Navy Day (October 27). In 1922, the Navy Department gave official sanction for Navy Day and encouraged its various commands to observe the occasion through exhibitions, open houses, luncheons and other activities for the public.



The United States Navy Yard
BOSTON, MASS.

MAP OF THE YARD
SHOWING
IMPROVEMENTS TO JUNE 30, 1920.

Scale of Feet

399-97

BUILDINGS

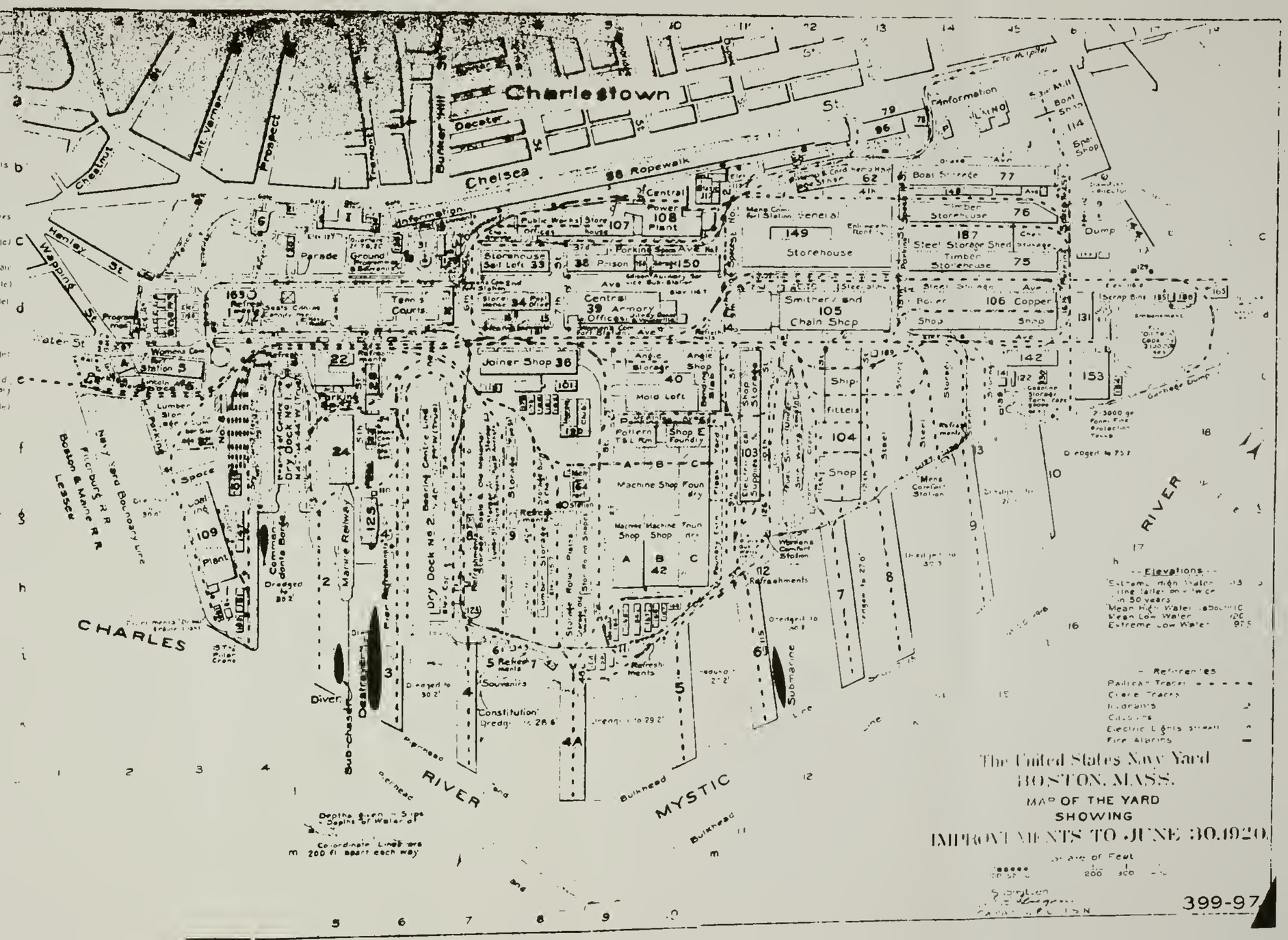
P.W. = Public Works Dept., H. = Hull Division, M. = Machinery Division, S.D. = Supply Dept., M&S. = Medicine & Surgery, U.S.M.C. = U.S. Marine Corps.

No.	Location.	Officers' Quarters
A	d2	Mail Messenger
B	d3	Junior Aid to Commandant
C	d3	Construction Officer
D	d3	Senior Assistant Hull Division
E	a3	Disbursing Officer. (Yard)
F	d3	Supply Officer
G	c4	Commandant
L	a14	Capt. of Yard & Senior Aid to Comdt
M	a15	Public Works Officer
N	a15	Engineer Officer
O	a15	Medical Officer
P	a14	Junior Assistant, Machinery Divn
2C	c7	Pharmacist
1	c5	Colonel (Command's Officer) U.S.M.C.
2A	c6	Major, U.S.M.C.
2B	c6	Major, U.S.M.C.
2C	c6	Lieutenant, U.S.M.C.

Barracks

No.	Location.	Barracks U.S.M.C.
1	d2	P.W. Storage of Automobiles
4	e2	Labor Board
5	e3	Various First Naval District Chaplain, Museum Library, Pay Office, Commissary Small and Clothing Stores Barber Shop, Printing Office etc
10	g4	Cp'd Laundry
19	i15	S.D. Yard Scales
20	c4	P.W. Comdt's Old Stable, (Tool Storage)
21	c4	P.W. Greenhouse
22	e5	P.W. Laborers & Mechanics Storage
23	f5	P.W. Water Closets
24	f5	H. Riggers & Laborers
29	e6	P.W. Restaurant & Recreation Room
31	c6	P.W. Captain of Watch, Telephone Exchange.
32	d7	P.W. Pay Office
33	c8	H. Sail Loft
		S.D. Storehouse
34	d8	Various Officer of the Day, Transportation Officer, Post Office, Trade School, Storehouse, Chemical Laboratory
36	e8	H. Joiner Cabinet, Shipwright Block & Upholstery Shops
38	c9	H. Storehouse, Chapel, Prison
39	d9	Various Central Offices, Commandant, Captain of Yard, Offices of Inspection & Accounting Depts. Offices & Drafting Rooms Hull & Machinery Divs. Various Officers, Armory
40	e10	H. Angle Shop Laying Out Floor, Bending Slab & Mold Loft
42A	f10	M. Machine & Erecting Shops
42B	f10	M. Machine Shop, Offices & Instrument Room
42C	f10	M. Steel & Iron Foundry
42E	f10	M. Pattern Shop & Storage, Toilet & Locker Rooms, Brass Foundry, Torpedo Testing Plant
44	c9	M. Temporary Storage, Parts of Ships under Repair
47	e8	Cp'd Asst. Capt. of Yard, Progress men's Office
48	c9	Cp'd Storage of Old Material
49	e8	Cp'd Boatswains' Lockers
58	b9	H. Ropewalk
60	b12	H. Tarring House, Ropewalk
62	b13	H. Ropewalk
		S.D. Storage for Hemp & Rope
75	c15	S.D. Storehouse for Timber
76	c15	S.D. Storehouse for Timber
77	a5	S.D. Storage for Small Boats & Equipment
78	a1	H. Storage, Boat Material
79	a13	H. Boat Shop
96	a3	S.D. Storehouse
97	c2	P.W. Gate House, Yard Entrance
101	e8	M. Millwrights Shop
103	i11	M. Electric Shop
104	f12	H. Shipfitters, Plumbers & Sheet Metal Workers Shops
105	d2	H. Smithery & Chain Shop
106	d15	H. Boiler & Cooper Shops
		H. Galvanizing & Plating Shops
107	c9	P.W. Public Works Offices
		S.D. Storehouse
108	c10	M. Central Power Plant
109	g3	S.D. Coaling Plant
110	g6	H. Pitch House
113	e7	M. Storehouse for Power House Material
114	a16	H. Saw Mill, Boat & Spar Shops
115	i11	H. Tool House, Pier 6
117	b10	P.W. Garage, Stable & Carriage House

No.	Location.	Dept. occupy.	Shops, Storehouses etc
120	c7	M&S	Dispensary
122	e15	U.S.M.C.	Rifle Gallery
123	h7	H.	Pump Well for Dry Docks
124	f6	P.W.	Water Closets
125	g5	H.	Paint Shop
		M.	Electric Sub Station
126	g11	P.W.	Water Closets
127	f14	P.W.	Water Closets
128	f14	P.W.	Watchmans Station
130	e15	S.D.	Condemned Stores
131	d16	S.D.	Storehouse for Oils & Paints
134	e17	M.	Electric Sub Station
135	d17	P.W.	Refuse Kiln
136	c6	U.S.M.C.	Administration Building
139	e15	S.D.	Pump House for Gasoline
141	e15	S.D.	Pump House for Fuel Oil
142	e15	S.D.	Storehouse Condemned Stores
143	b12	P.W.	Water Closets
144	c17	P.W.	Locomotive & Crane Shed
147	g4	S.D.	Storehouse (Steel portable)
148	b14	S.D.	Storehouse
149	c12	S.D.	General Storehouse
150	c10	P.W.	Garage (Yard), Edison Auxiliary Service Sub Station
151	h4	S.D.	Storehouse (Steel portable)
153	e16	S.D.	Battery Charging Station
154	i9	M.	Storehouse (Steel portable)
155	i9	M.	Storehouse "
156	i9	M.	Storehouse "
157	i10	M.	Storehouse "
158	i9	M.	Storehouse "
159	h3	S.D.	Storehouse for Coal
161	i9	M.	Shop Offices (Wood, portable)
162	i4	S.D.	Storehouse for Coal
163	d4	P.W.	Band Stand
164	g9	M.	Toilet, Wash & Locker Building, for Building 42 (Temporary)
165	d18	H.	Acetylene Plant
166	i10	M.	Storehouse (Steel portable)
167	i10	M.	Storehouse "
168	h10	M.	Storehouse "
177	c16	S.D.	Storehouse
178	e8	H.	Storehouse
179	e8	H.	Storehouse
180	f5	H.	Storehouse
181	e8	H.	Storehouse
182	e8	H.	Storehouse
183	e8	H.	Storehouse
186	i9	H.	Storehouse
187	i14	S.D.	Steel Storage Shed
188	d18	H.	Storage for Pipe, Steel, etc.
189	e13	H.	Platefield Office
190	f8	Cp'd	Ingram Club
129	c17	Cp'd	Office, Dump



The United States Navy Yard
BOSTON, MASS.
MAP OF THE YARD
SHOWING
IMPROVEMENTS TO JUNE 30, 1920.

399-97

plant. The manufacture of fiber rope expanded and that of wire rope ceased. The second floor of the wire rope mill was converted into a braiding room for the production of signal halyards and distance lines. Ropemaking machines were also installed in the first floor of Building No. 62, the hemp house.[40]

After the armistice, an improvement program, costing almost one million dollars, was undertaken in the machine shop and foundry, Building No. 42. That work included demolition of the former copper, testing, and pipe shops as well as Building No. 43 and replacing them with modern construction. A large lean-to extension was added to the foundry.

Wartime required that dry docks and piers be in use and not undergoing repairs or rebuilding. When fighting began in Europe, both of the Boston yard's docks were in good condition, No. 2 being relatively new, and No. 1 having been thoroughly repaired in 1907 and 1908. Starting in the summer of 1916, the two docks saw almost continuous usage, 102 dockings occurring in 1917, 136 in 1918, and 171 in 1919. The drainage system in Dry Dock No. 2 needed enlarging, and parts of the masonry of both docks required repairs. However, the crowded docking schedule resulted in the postponement of such work.[41]

Of the various parts of the yard's waterfront, probably the piers suffered the most from heavy usage occasioned by wartime

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40. Data for Annual Report, Bureau of Construction and Repair, Jul. 1919, 181-39, Box 557, #13.

41. Annual Report of Inspection of Public Works and Public Utilities, Jul. 3, 1918, Box 523, #6.

activity. With so many vessels, including large warships, being berthed and unberthed, the wharves inevitably became damaged, particularly since all but one was of wooden construction. In July 1918, the Public Works Officer reported that Wharves Nos. 2, 3, 4, 6, 7, and 8 were unsafe for cranes. On June 25, 1918, a new bulkhead line was established farther out in the harbor. However, neither repairs nor extension of the piers could be undertaken because of the immediate pressing need for their services.

In 1916, Congress authorized the expenditure of $6 million to improve navy yards for the repair and construction of ships and stipulated that the Secretary of the Navy could add to the plants of several yards, including Boston, to enable them to repair and construct battleships. Of course, yard officers found attractive the prospect of capital ship construction. The construction officer recommended extending the existing building ways inward to provide the required length. If built on those ways, a battleship's bow would stretch over First Avenue, necessitating changes in roadways, railroad tracks, and buildings. However, the desire to build a battleship went unfulfilled, and the Navy Department decided Boston should continue the construction of auxiliaries.[42]

THE EXPANDED WORK FORCE

Wartime conditions confronted administrators of navy yards

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42. P.L. 241, Aug. 29, 1916. vol. XXXI, p. 618 ; Annual Report, Bureau of Construction and Repair, Jul. 1, 1916, 181-39, Box 285, #16.

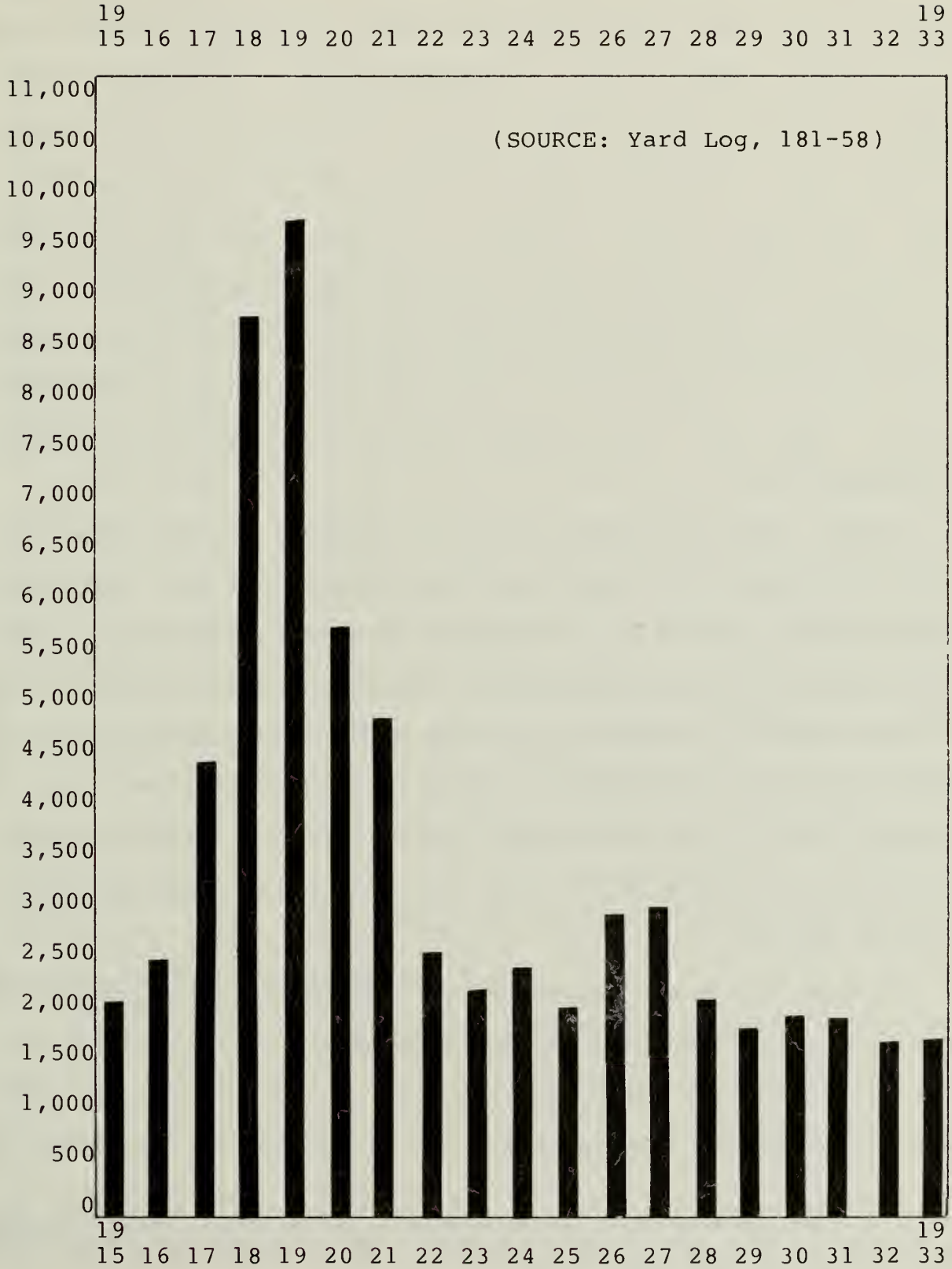
with serious problems, among them the task of recruiting and retaining large numbers of workers, including skilled mechanics. Navy yards competed for manpower with private employers, other government operations, and the nation's military services. During much of World War I, navy yards theoretically paid their workmen the same wages as private employers in the vicinity, so there should have been no competition respecting pay. Navy yards may have had an advantage over commercial employers, because of the granting to government workers of paid holidays and leaves. In fact, in August 1916, Congress increased the annual leave for manual workers from fifteen to thirty days.[43] The greatest threat to the hiring and retention of labor by the yards came from the military services.

The problem arose before America formally entered the war and before conscription went into effect. During 1915 and 1916, a preparedness movement swept the country. Although most Americans continued to favor neutrality, many agreed with the interventionists that the nation should have a competent military establishment. In several enactments, Congress responded to the preparedness sentiment. On June 3, 1916, it passed the National Defense Act, which, among other things, created a larger army and established a National Guard of 450,000 men, with provision for summer training programs. Popular opinion encouraged men to volunteer for the militia, and the Navy Department feared the temporary loss of navy yard workers.

Secretary of the Navy Daniels dispatched a telegram to the

43. P.L. 241, Aug. 29, 1916, SAL, vol. XXXI, pp. 617-8.

Table No. 6: TOTAL CIVILIAN EMPLOYEES ON JUNE 30, BOSTON NAVY YARD, 1915-1933



Boston Navy Yard, instructing its officers to "use every effort to prevent the loss of men [by] militia duty." The Secretary argued that yard employees had a patriotic duty to remain at their work, since "their services to their country in this capacity is as important as if they were actually in the field." He concluded that "to cripple the navy yard at this time is a most unpatriotic act." Within a month, the Navy and War Departments agreed to an arrangement whereby yard workers in the National Guard could be discharged from the army unit upon action initiated by the heads of yard departments. However, such discharges were not to be sought without the consent of the men themselves.[44]

Since the guard consisted of volunteers, it presented far less a problem than the selective service system, which was enacted on May 18, 1917, six weeks after Congress declared war. That system initially required the registration for the draft of all men between the ages of eighteen and thirty, inclusive. In August 1918, an amendment altered the legislation so that it applied to men between eighteen and forty-five. Sixteen percent of the nation's male labor force served in uniform before the end of World War I.

Because the draft could disrupt operations at navy yards, an exemption system for yard employees prevailed throughout the war. Employees in navy yards were required by law to register with their local boards. During the first six months of the selective

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44. J. Daniels to Navy Yard, Boston, Jun. 24, 1916; Acting Secretary of the Navy to All Bureaus, Navy Yards, Jul. 22, 1916, both in 181-39, Box 288, #15.

service system, a procedure existed whereby boards granted exemptions to "artificers and workmen" who submitted affidavits from a yard commandant. Such an affidavit certified that the worker's services were necessary to the efficient operation of the yard and that he could not be replaced with another person without loss of efficiency. The decision whether or not to grant the exemption rested with the local draft board. At the Boston yard, Commandant Rush seemed more ready than the Secretary of the Navy to include among the indispensable personnel "clerks and stenographers who, from their long service or particular skill, cannot be replaced."[45]

In November 1917, the first system of exemptions ended, and President Wilson ordered a new one, according to which men "engaged in the building or fitting of ships" were transferred from the draft registers to the Emergency Fleet Classification List. Men so listed were not liable for military service. The general purpose of the regulations of November 1917 was the same as in the first system, to keep irreplaceable men in the navy yards. However, in the new system, navy yard commandants had authority, within certain limits, to determine who should be transferred from the selective service registries to the Emergency Fleet Classification List.

Orders from the Navy Department in Washington held that laborers and men in the clerical, messenger, inspection, and police force were not to be transferred by commandants. However,

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45. General Order No. 61, Aug. 2, 1917, 181-39, Box 343, #15; Special Order No. 66, Aug. 22, 1917, 181-39, Box 335, #11711.

a commandant could inform the Navy Department of particular clerks, messengers, inspectors, or yard policemen who had been employed for a year or more and who were regarded as important to the functioning of the yard. The Secretary would then decide if any of them should be placed on the Fleet Classification List and thus be exempted from the draft. The system required much paper work, since local draft boards had to be informed of men placed on the list as well as those no longer qualifying to be so enrolled or who had been discharged from employment at the yard. These administrative details were assigned to yard Labor Boards.[46]

The Emergency Fleet Classification List provided greater protection from the draft for indispensable yard workers than the earlier exemption arrangement. Prior to November 1917, the final decision, the granting of an exemption, rested with the local selective service board. The new system took that power from the board and gave it to yard commandants. As intended, the Emergency Fleet Classification List favored supervisory workmen, skilled mechanics, probably most helpers, and draftsmen. In a letter to Commandant Rush in December 1917, the supply officer complained that his clerks were being drafted. He stated that the department's purchasing section "has but two civilians left." Apparently, the letter resulted from the refusal of the Secretary of the Navy to exempt three highly valued Supply Department

46, Secretary of Navy to Commandant, Nov. 20, 1917, 181-39, Box 342, #15.

clerks.[47]

It was quickly discovered that conscription gave greater importance to the the rule that workers be fired for missing six consecutive musters, since discharge from the yard meant removal from the Emergency Fleet Classification List and thus possible induction into the army. Although that possibility provided the yards with a weapon to fight absenteeism, the Navy elected to delay one week after the sixth muster before notifying selective service authorities. This allowed men with valid excuses to remain on the list and at work in the yard.[48]

In addition to protecting workers against the draft, the Boston Navy Yard made other efforts to keep up the strength of the work force. Trade schools were established in which unskilled workers could be trained for positions as mechanics. The length of the apprenticeship program was reduced from four to three years. The Dispensary provided regular physical examinations to encourage employees to take care of their health and avoid absence because of sickness. Women were employed in capacities as telephone operators, office workers, and ropemakers. In addition, Navy "yeo-girls" performed clerical chores. The yard seems to have had moderate success in its recruitment of labor. In 1917 and 1918, approximately 240,000 people applied for work, and, according to a newspaper account, practically all labor requisitions were filled. On the other hand, difficulties arose

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47. Supply Officer to Secretary of Navy, Dec. 22, 1917, 181-39, Box 342, #5.

48. General Order No. 30, Dec. 12, 1917, 181-39, Box 335, #1171; General Order No. 31, Dec. 14, 1917, 181-39, Box 342, #15.

in securing coppersmiths, shipfitters, loftsmen, diesinkers, and riveters. Also, the lack of men was blamed for a six-month delay in the construction of Brazos, Fuel Ship No. 16. Launched in June 1917, the vessel was not finished until two years later.[49]

Expansion of the work force was the most important technique employed at the Boston yard to provide the manpower needed to perform the increased volume of ship work. Toward the same end, overtime became common, and the yard remained opened on some holidays and occasionally on Sundays.

For a year after 1914, the number of employees at the yard remained roughly at 2,000 and then began to rise in a modest fashion. At the end of 1915, there were 2500 employees and a year later, 3,000. The most spectacular increase came in 1917 and 1918. The labor rolls totaled 4500 in June 1917, 6600 in January 1918, and 10,000 in mid-July 1918. The armistice in November did not halt the trend, and on February 11, 1919, the greatest work force yet in the yard's history, 12,844, reported. When the reversal did come, it was not as precipitous as might be supposed, and not until 1922 did employment figures sink below 3000.[50]

Approximately one year before America declared war, evidence of an emergency situation began to appear at the Boston Navy Yard. On direct orders from the Navy Department, the yard did not close, as had been traditional, on Bunker Hill Day, June 17,

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49. Oral History Interview, BNHP, John Langan, p. 1; Article in unknown newspaper, Jul. 20, 1919, 181-83; Data for Annual Report of Bureau of Construction and Repair, Aug. 23, 1918, 181-39, Box 438, #13, p. 12.

50. For employment figures, see Yard Log, 181-58.

1916. At that time, a heavy backlog of work engulfed the shipsmiths shop, chiefly because of the inadequacy of space for additional machine tools. During some weeks of the following months, certain sections of the shop, such as chainmaking and the drop forge, operated on a sixteen- or twenty-four-hour basis. In the following October, the commandant advised the Secretary of the Navy that the existing ship repair work almost matched the yard's capacity under an ordinary routine. With the expected arrival of the battleship Nebraska, the yard would have more work than it could handle. Rush, however, preferred to extend the repair time allowed by the Department for particular ships, rather than make other changes. He claimed that production could not be increased by hiring additional employees, "since there are very few mechanics available in this part of the country." He also recommended against changing the yard to a ten-hour day, because "the increase in cost is so far out of proportion to the increase in output."[51] Obviously, the commandant had not yet shifted his thinking to a wartime footing. He did so soon, with some interesting results.

Within a few months, the Department of the Navy set aside consideration of costs and directed the yard to "rush all repairs on Destroyers, Scouts, Battleships" and authorized overtime and shifts. Congress enacted a provision allowing the president to suspend the eight-hour day for government workers, and Wilson

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51. Special Order No. 34, Jun. 9, 1916, 181-39, Box 289, #159; Annual Report of Construction and Repair, Jul. 1, 1916, 181-39, Box 285, #13; Commandant to Secretary of Navy, Oct. 23, 1916, 181-39, Box 290, #19-312.

used that authority on March 22, 1917. By the following month, the Boston yard was generally on a schedule of ten hours a day, although no uniformity existed for all shops. Because of the war's disruption of the importation of hemp, the ropewalk was temporarily limited to eight hours. The chain shop had three eight-hour shifts and the drop forge two ten-hour shifts. Sunday work had started in March 1917, although officers sought to limit that to no more than absolutely required.[52]

The machine shop of the Machinery Division had difficulty finding a satisfactory schedule agreeable to all workmen. Before, after, and at the end of a week-long experiment in April 1917 with two ten-hour shifts, a committee of machinists informed the Engineering Officer of their dislike for that routine. With the approval of the Navy Department, the shop returned to eight-hour shifts, although "quite a number of machinists" disagreed with the committee and preferred working ten hours instead of eight. In July, that shop became fully committed to a permanent three-shift schedule, the men remaining on a given shift for four weeks and then rotating to another.[53]

The number and length of shifts never became universal throughout the yard. In September 1917, four different patterns prevailed in the Hull Division: three eight-hour shifts (shipfit-

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52. Special Memorandum, Dec. 2, 1917, 181-39, Box 358, #312; P.L. 391, Mar. 4, 1917, SAL, vol. XXXIX, p. 1192; Secretary of Navy to Bureaus, Offices, Commandants, Mar. 23, 1917, 181-39, Box 345, #15919; Naval Constructor to L. S. Adams, May 16, 1917; W. Baxter to Superintendent of Ropewalk, May 31, 1917, both in 181-39, Box 345, #15919.

53. General Notice, May 9, 1917; Order No. 85, July 16, 1917, both in 181-39, Box 345, #15919.

ters shop); two ten-hour shifts (sail and rigging lofts, rope-walk, and general smith, drop forge, and chain shops); one ten-hour shift (boat shop and sawmill); and one eight-hour shift (shipwrights, joiner, riggers and laborers, and paint shops).[54]

Whatever the pattern, conditions were far from normal in the yard. War provided more work, more jobs, and higher wages and also created some tensions.

Between 1915 and 1917, navy yard wages generally were fixed as previously, but starting with America's declaration of war, a new system went in effect. Prior to the spring of 1917, wage rates remained constant, but thereafter they rose substantially.

The Boston Navy Yard's Board on Wages conducted itself in 1915 and 1916 more or less in the same fashion as before the beginning of the war in Europe. On the basis of information collected from private employers in the area, the board proposed an annual wage schedule for the approval of the commandant and the Navy Department. No representative of workmen sat as a member of the board as had been proposed in 1913. However, the board began its deliberations in early October, a change introduced by Assistant Secretary of the Navy Franklin D. Roosevelt. Roosevelt took a more active role in wage fixing than prior secretaries and assistant secretaries. He specifically directed the Boston wage board in 1915 to include in its proposed schedule for 1916 the recommendation that the compensation of quartermen and leadingmen be increased to thirty

54. General Notice No. 94, Sep. 29, 1917, 181-39, Box 345, #15919.

percent and fifteen percent more than first-class mechanics in their trades. The Assistant Secretary also instructed the wage board as to the kinds of area firms to be contacted and the particular information to be solicited from them. He continued arrangements whereby, when desired by workmen of a yard, he would send a representative from Washington to conduct a hearing on wages.[55]

When Roosevelt joined the Navy Department in 1913, he favored greater worker participation in navy yard wage procedures. For many years, the Boston yard's Wage Board had extended workers the right to appear before it and make presentations concerning a proposed schedule. The submission of documents on prevailing rates in the area often accompanied those presentations. As the number of employees increased, many shops or trades selected committees of workmen to collect data for submission to the board. Concrete evidence of the wages paid to employees of firms in the vicinity was crucial to the process of establishing navy yard wages. When the board sought information from private employers, it promised them confidentiality. During the preparation of the 1916 schedule, the "wage committee" of Engineering Division machinists requested the Board on Wages to provide it with copies of data secured from industrial establishments. The board refused because of the promise of

55. Acting Secretary of Navy to Commandant, Sep. 1, 1915; Senior Member, Wage Board, to Commandant, Oct. 21, 1915, both in 181-39, Box 232, #158; Assistant Secretary of Navy to Commandant, Nov. 21, 1915, 181-39, Box 289, #158.

confidentiality.[56]

The board working on the 1917 schedule followed a different procedure. In effect, it encouraged workers' committees to collect the required data and provided them with identification papers, official Navy forms, and government envelopes addressed to the Board on Wages. The board also furnished a list of firms from which information was desired and invited workers to add employers to that list. Members of the workers' wage committees were permitted to take leave from work, without penalty, to collect information.[57] This change may have reflected the desires of Assistant Secretary Roosevelt and may also have been instituted to respond to the dissatisfaction that workers had demonstrated over the years to the wage-fixing process.

In 1915 and 1916, as had become common, different groups of workers protested against wages for their ratings established in the most recent schedule. Regardless of the merits of those protests, neither the Board on Wages at the yard nor the Navy Department in Washington favored altering a current schedule. In one instance, the board relented. As had been the practice for many years, private construction firms in Boston negotiated wage agreements with their employees, including house carpenters, as of June 1. In 1916, that contract resulted in an increase of twenty-four cents a day for carpenters. On the basis of information provided by yard workmen and collected by the board

56. Senior Member, Wage Board, to Charles H. Taylor, Oct. 20, 1915, 181-39, Box 232, #158.

57. Proposed Schedule of Wages for 1917, 181-39, Box 289 (1917), #158.

itself, a recommendation, approved by the commandant, was made in July 1916 for a similar increase for yard carpenters.[58]

The wage schedules in effect at the Boston Navy Yard for the years 1915 and 1916 continued the 1914 rates in ninety percent of the trades listed. Most of the changes consisted of modest increases, but the pay of furnace heaters declined from $4.88 in 1915 to $3.60 in 1916 and plasterers from $5.20 to $4.72.[59]

Matters pertaining to navy yard wages changed dramatically beginning in early 1917, when America's abandonment of neutrality for belligerency became imminent. The war in Europe had revived the nation's economy, and by 1917 prices and wages had risen sharply. The demand grew for skilled workmen, including those in shipyard trades. Organized labor became more assertive and walk-outs, boycotts, and strikes frequently occurred. Once the United States declared war, labor protests, especially in industries crucial to the prosecution of the war, were regarded as unpatriotic.

The Wilson administration created a vast network of boards, committees, and agencies, involving government officials and spokesmen for private industry, to coordinate utilization of capital, materials, manpower, and transportation. Included in the

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58. For examples of efforts to secure changes in a current schedule and the Navy's response, see Wiremen to Secretary of Navy, Jan. 10, 1916; Granite Cutters to Labor Board, Aug. 17, 1916; Frank Lyon to Wage Committee Representing Toolmakers, all in 181-39, Box 289, #158; Commandant to Frank Tully, Blacksmiths and Helpers Union, Aug 23, 1916, 181-39, Box 288, #159; Board on Wages to Commandant, Jul. 21, 1916, 181-39, Box 288, #158.

59. Schedule of Wages, 1914, 181-39, Box 271, #158; Schedule of Wages, 1915, 181-39, Box 232, #158; Schedule of Wages, 1916, 181-39, Box 288, #158

apparatus were several agencies dealing specifically with labor. Such agencies included representatives of organized labor or sought labor's cooperation. Generally, American labor fared well during the war, winning improved benefits and working conditions and obtaining wage increases in excess of the spiraling cost of living. What this meant was that navy yard wages were no longer a local matter to be worked out at each yard.

Congress altered the 1917 wage schedule for navy yards on March 4, 1917, when it provided an increase of five or ten percent for all "civilian employees in the Naval Establishment" receiving salaries or wages at the rate of $1800 a year or less. The increase went into effect on July 1, 1917. Congressional action subverted the principle that navy yard wages should correspond to the pay given by private employers in the vicinity. That development and strikes in the private sector may have occasioned two outbreaks of labor unrest in the Boston Navy Yard in 1917.[60]

In May, nineteen sailmakers walked out, protesting the introduction of piecework prices for stitching eyelets in hammocks. The sailmakers claimed that the rate of forty cents per hammock did not enable them to equal the $4.00 they would have received under the day rate. They also complained against the use of laborers and helpers to work hammocks.[61]

A telegram from the Bureau of Supplies and Accounts in Washington may have prompted the changes in the sail loft, since

60. P.L. 391, Mar. 4, 1917, SAL, vol. XXXIX, p. 1195.

61. Shop Superintendent to Construction Officer, May 7, 1917, 181-39, Box 345, #15915.

the bureau reported that it had back orders for 75,000 hammocks. The shop superintendent, Fred G. Coburn, investigated the situation and discovered that in an eight-hour day sailmakers at the Boston yard completed nine hammocks, those at Mare Island ten, and those at Norfolk eleven. Thus to increase production at Boston he changed to a piece-rate system. The same motive led him to employ helpers and laborers in the work of stitching eyelets in hammocks, a task he claimed even sailmakers regarded as "dull, routinary, uninteresting simple work." Once the laborers and helpers became competent, Coburn planned to switch the sailmakers to "real sailmakers' work." Coburn had arrived in the yard two years previous, just in time for the chain shop strike of 1914. He blamed the difficulties in the sail loft on the shop master and his quarterman sailmaker, who had failed to explain the situation to the sailmakers and to take other steps required for a trouble-free change. One of the strikers returned after one day, and most of the rest followed shortly thereafter.

Another incident occurred on September 19, 1917, when a meeting of molders produced an ultimatum threatening a strike unless they received a wage increase to at least $5.00 a day. Nothing seems to have come of the threat, and perhaps the Navy advised the molders to be patient and await the results of a new wage schedule.[62]

During 1917 and 1918, a number of strikes occurred or were threatened at private establishments in the Boston area. Some of these concerned the yard, since the companies involved performed

62. Boston Navy Yard to Secretary of Navy, Sep. 1917, 181-39, Box 345, #15915.

work for the Navy, either under direct contract with the Department in Washington or through an arrangement with the Industrial Department of the Boston Navy Yard. In July 1917, 375 workers struck the George Lawley company, all of whose work at the time was for the government, namely building submarine chasers. The company's president regarded the walkout as a "very unpatriotic and unamerican procedure." Labor troubles in November at the Fore River plant in Quincy were submitted to a conciliation panel, which requested the assistance of three master machinists from the Boston yard. In January 1918, plumbers threatened a strike at the Atlantic Works of East Boston, which, under the supervision of the navy yard, was then repairing several Navy vessels. In August 1918, organized labor boycotted the Simpsons' Patent Dry Dock Company. That company itself did not work on ships, but rented its dry dock to owners or agents of vessels, who made contracts with various firms for work at the dock. One of these firms, James Barker, ran an "open shop." A group of unions ordered its members not to work at Simpsons' until Barker was "eliminated." The boycott resulted in slight delays on repairs to a Navy barge and a lighter.[63]

A threatened strike at a different kind of establishment was also brought to the attention of the yard administrators. Managers of the Boston Street Railway, whose service extended to the suburbs, anticipated a strike by their employees. Apparently workers and management reached a settlement without a work stop-

63. G. F. Lawley to Commandant, Jul. 17, 1917; Committee on Public Safety, Nov. 13, 1917, both in 181-39, Box 345, #15915; Atlantic Works to Capt. Rush, Jan. 25, 1918; Simpsons' Dry Dock to Capt. Rush, Sep. 11, 1918, both in 181-39, Box 452, #15915.

page. Interruption of the line's service would have created problems at the navy yard, since many of its workmen depended on the railway for transportation to the yard.[64]

The Boston vicinity probably had no more than its share of labor turmoil during World War I, but given the mood of organized labor in the area, the navy yard seems fortunate in having had to contend with only one threatened and one brief strike among its own workers.

That record in part resulted from the Navy's policy of discharging any worker who missed more than six consecutive musters. The relaxation of Civil Service regulations and the need for workmen doubtless resulted in the flexible application of the six-muster policy, but the Navy and yard officials inclined toward a tough stance regarding workers who actually engaged in a strike. Also important in shaping the attitudes and actions of yard workmen was the improvement in wages.

During the war, fixing of yard wages was largely taken out of the hands of the Navy. Beginning in September 1917, wages at all navy yards were "awarded" by the Shipbuilding Labor Adjustment Board of the Emergency Fleet Corporation, part of the wartime apparatus to mobilize and regulate the national economy. Until November 1918, a single wage schedule prevailed for all of the navy's continental yards. New schedules appeared quite rapidly, each of them providing for an increase in wages. The Labor Adjustment Board placed new nationwide schedules in operation on on September 24 and November 1, 1917, and May 1,

64. Boston Elevated Railway to Commandant, Feb. 26, 1918, 181-39, Box 452, #15919.

1918. In two other schedules, one implemented on November 1, 1918, and the other on September 16, 1920, the board established different rates for East Coast and West Coast yards.[65]

For seventy-eight first-class ratings in the Boston Navy yard schedules for the period from the beginning of 1914 to the end of 1918, the median increase was about seventy percent. Most of the gains resulted from wage improvements in 1917 and 1918. Of the three groups covered by the wage schedules, Group II (helpers) received the largest boosts. During the period 1914 to 1916, most helpers were paid $2.24 a day. By the end of 1918, they received $4.32. At the time of the armistice, the highest paid mechanics were those in the smitheries, foundries, and forges, such as anglesmiths ($7.68); blacksmiths, heavy fire ($7.68); forgers, heavy ($11.84); lead burners ($7.92); and melters ($8.56). In November 1918, the per diem rate of $6.40 was fairly standard for many basic shipyard trades, including boatbuilders, boilermakers, caulkers, electricians, shipjoiners, machinists, millmen, molders, plumbers, riggers, sheet metal workers, shipfitters, and shipwrights. With overtime work fairly common in 1917 and 1918, most Boston yard workmen had fatter pay envelopes than ever before.[66]

Beyond the sailmakers' walkout in May 1917, the threatened molders' strike in the following September, and less vigorous complaints regarding wages, there seem to have been no major collective protests by yard labor against management in 1917 and

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65. McPherson and Watts, pp. 4-5.

66. Schedule of Wages...Effective Nov. 9, 1918, 181-39, Box 665 (1920), #11.

1918. In several instances, employees demonstrated their support of the war and the yard's role in it. The Boston Navy Yard was the only yard in the nation in which 100 percent of the employees subscribed to the Third Liberty Loan. In a different kind of display of commitment, some workers were ready to break ranks with organized labor when a strike occurred among employees of a contractor building the general storehouse. A committee representing yard workmen informed the administration that, if the strike continued, mechanics from the yard were prepared to complete the project under the direction of the Public Works Officer.[67]

Patriotism alone did not necessarily produce dedicated workers, and yard officers occasionally found employees lacking in enthusiasm or good work habits. The Hull Division Shop Superintendent, in July 1917, complained about the chainmakers and shipsmiths. He contended that "the morale and discipline of the shop are not so high as we would like to have them" and noted that output "had already slipped very considerably." He claimed that it would take a "feeling of patriotism in the men, coupled with a firm hand in dealing with them to improve production." These particular remarks were evoked when the men requested closing the shop on hot summer afternoons, as had been customary before the war.[68]

Capt. William Rush, commandant throughout the war, seems

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67. ARND, 1918, p. 668; Dispatch, Boston Navy Yard, Nov. 3, 1917, 181-39, Box 345, #15911.

68. Shop Superintendent to Construction Officer, Jul. 21, 1917, 181-39, Box 345, #16.

to have subscribed to a form of the "firm hand" approach toward all groups in the yard. That approach as applied to workers and his alleged abusive treatment of officers led Naval Constructor Thomas Roberts to chronicle and document his superior's actions in an effort to have Rush removed.

According to the commandant, the "yard policy" was "early and energetically at work and then ease up in the later part of the day." The meaning of this policy for morning hours was important, since Rush, accompanied by officers and orderlies, made a daily inspection of the waterfront and some other areas of the yard between 8:00 and 9:00 a.m. Officers supervising work on ships under repair were expected to await his arrival and accompany him on a tour of their vessels. When the captain discovered instances of violation of the "early and energetically at work" policy, he did not seek an explanation, but dealt with matters in summary fashion. One morning, he noted a reserve officer entering the yard, and thus not "early" at work, in "a shabby looking automobile, a noisy rig with no paint on it." The captain ordered a "caution" be sent to the driver. On the same occasion, he found that two enlisted men were not at their duties in the printing shop and directed the captain of the yard to find them and withdraw their passes.[69]

At least for a time, Rush followed the practice of ordering the arrest, expulsion from the yard under guard, and discharge of workmen he regarded as loafing on the job or displaying other

69. Memorandum, Aug. 27, 1917, 181-39, Box 308, #411-R; Memorandum, Nov. 21, 1917, 181-39, Box 336, #1211.

forms of improper behavior. In November 1917, the foreman of riggers and laborers stated in an affidavit supplied to Naval Constructor Roberts that in the past year, "the commandant had arrested two riggers and 4 laborers and ordered them discharged." That procedure caused "confusion, not only in my department but in other departments of the Hull Division, their men also being boosted out of the yard, after having been placed under arrest." Rush acted without cause, according to the foreman, who found the men being disciplined "were not at fault and were not allowed to explain [to] the Commandant either before or after arrest."[70]

The affidavit of the foreman of riggers and laborers resulted from the captain's foray on Isabel on November 29, 1917. Even before reaching the deck of the vessel, Rush went into action, ordering the arrest and expulsion from the yard of a shipkeeper, who was sweeping the gangplank. Rush contended that the sweeping should have been done the night before. If given the opportunity, the shipkeeper would have agreed and also would have noted that he had just come on duty and that "it should have been swept by the fellow who was before me."

Once aboard Isabel, Rush sent Ensign Newsome Eichorn to check on some riveters on a lower deck, "who did not seem to be working fast enough." While on that errand, Eichorn came across an apparently idle shipfitter, Henry O'Neil, and in passing told him "to get busy." O'Neil either smiled or laughed just as the

70. Information in this paragraph and those which follow dealing with Captain Rush is taken from the report of Naval Constructor Roberts and attached affidavits: Roberts to Secretary of Navy, Dec. 9, 1917, 181-39, Box 336, #411-R.

commandant came onto the scene. Because of the alleged insubordinate behavior, Rush instructed his orderly to arrest O´Neil and have him discharged. When taking leave of Isabel, Rush directed Eichorn to "stay behind, find six men who were loafing and discharge them before noon."

O´Neil was not conducted out of the yard or discharged. Eichorn and other Hull Division officers intervened, since the shipfitter was in fact at work on the bridge of Isabel and the ensign "did not consider that O´Neil´s attitude was disrepectful." More importantly, word of O´Neil´s situation quickly spread through the yard, particularly exciting the shipfitters, the largest and most important Hull Division shop. The fear arose that if the commandant´s orders were carried out, the shipfitters would walk out, a devastating prospect.

Rush seemed to hold yard workmen in contempt. When Eichorn sought to protect O´Neil, the commandant said the shipfitter "will spit in your face next" and that "he is a scoundrel and will contaminate the other men." The foreman rigger claimed Rush called workers "loafers and bums" and generally berated them.

In his response to the Roberts report and collection of affidavits, Rush admitted to having said of shirkers among the workmen that "these men should be run up the yard-arm, shot, or imprisoned." Although "none of these dreadful things ever happen," the captain stated he "informed offenders that such things are quite likely to happen in a military organization in time of war." His chief defense appeared to be that he "had kept the war work going to the best of my ability though not to my satisfaction by any means." These statements reveal the commandant´s

mind set. Actually, of course, for loafing on the job, navy yard workers in time of war were not liable to be imprisoned, shot, or hanged. But apparently Rush believed that the state of war justified, even necessitated, his tirades against civilian employees as well as naval officers. Rush's explanation also reveals the curious mix in navy yards of military officers, in this instance an officer of the line honored by the nation for his martial valor, having management of an industrial organization manned by ordinary civilians, for whom the articles of war had no meaning.

THE WAR EFFORT OF THE BOSTON NAVY YARD

In the year and a half of America's active participation in World War I, the Boston Navy Yard performed a volume of work unmatched in any period of similar length in its previous history of more than a century. Ten thousand employees labored on approximately 450 different vessels, with some shops working around the clock seven days a week. Procedures for scientific management were scuttled, and emphasis was placed on getting the job done as soon as possible. Normal channels for the flow of orders and information were by-passed, and on one occasion, the yard's engineering officer, by telephone, thrashed out a completion schedule with the naval operations desk in Washington.[71] Bath Iron Works and Fore River Shipbuilding undertook part of the outfitting of destroyers they had under construction to expedite the completion of those vessels and to

71. Engineering Officer to Commandant, May 5, 1917, 181-39, Box 358, #3115.

PHOTOGRAPH NO. 8: USS Rhode Island at the Boston Navy Yard, September 11, 1915. Note crew members crowding the rails and the three-inch gun mounted on top of the eight-inch gun turret.

relieve pressure on the yard.[72]

Generally, during 1917 and 1918, the Boston Navy Yard repaired existing warships and navy auxiliaries; outfitted and commissioned new vessels; and repaired, altered, outfitted, and commissioned a variety of ships and boats taken over by the government. Battleships, cruisers, destroyers, submarines, and submarine chasers constituted the primary categories of warships arriving at the yard.[73]

When the United States declared war, four of the Virginia-class battleships were in the Boston yard in reduced commission. Georgia, Virginia, and Rhode Island had been undergoing extensive repairs, including installation of new boilers, overhaul of other machinery, ordnance work, and further alterations in fire control apparatus. Together with Nebraska, they were placed in full commission, and during the war, cruised the East Coast as units of the Third Battleship Division of the Atlantic Fleet. The yard also repaired the battleships Kearsage, Kentucky, and Delaware. A week after being undocked from Dry Dock No. 2 on Nov. 18, 1917, Delaware joined four other American battleships, crossed the Atlantic, and reinforced the British Grand Fleet at Scapa Flow.

In August 1917, the Boston yard was designated as the repair

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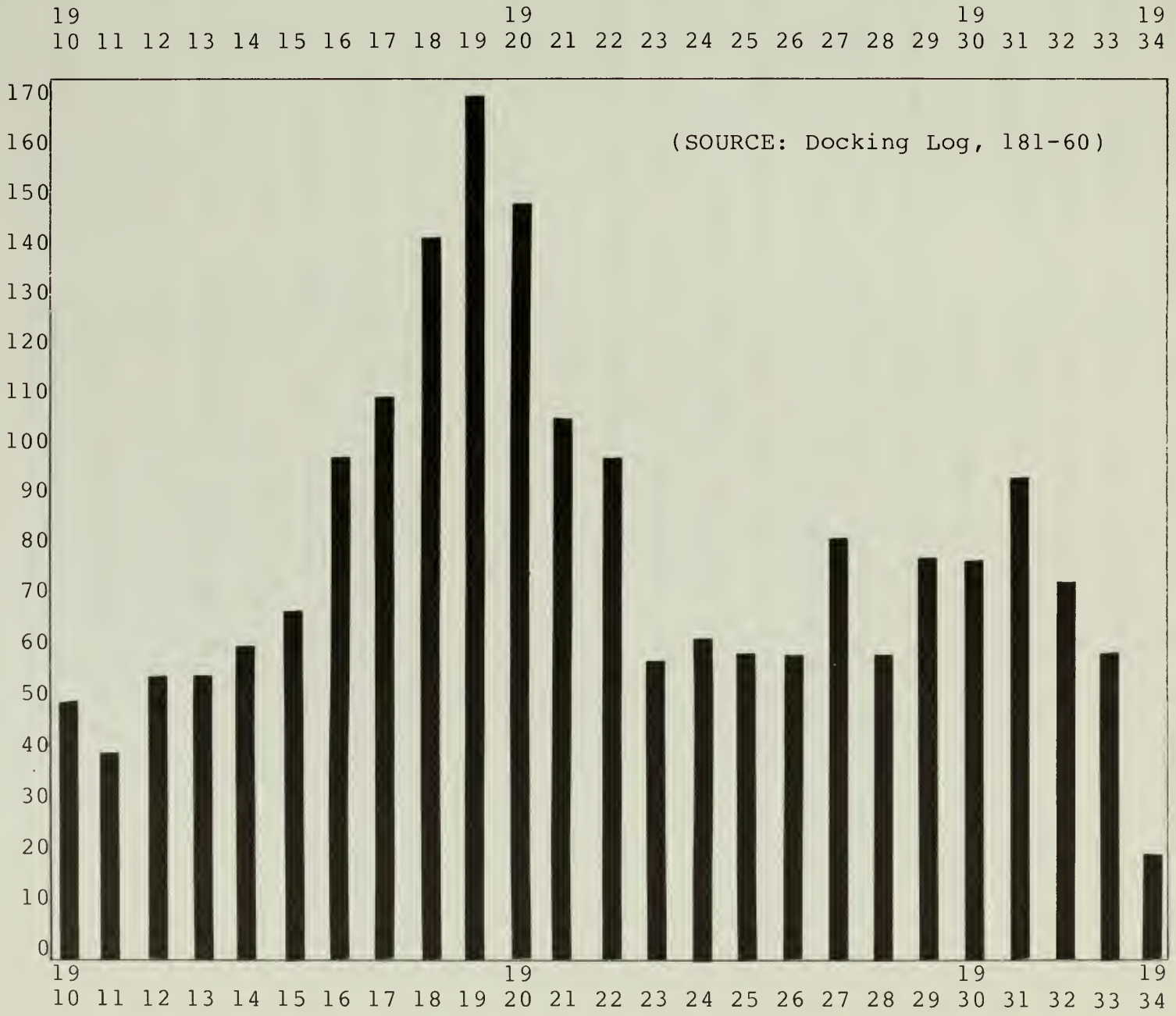
72. Bureau of Construction and Repair to Superintending Constructors and Commandants, Jul. 28, 1917, 181-39, Box 358, #311.

73. The best summation of the activity of the yard during the period is Work at the Boston Navy Yard under Bureau of Steam Engineering, Fiscal Year, 1918, 181-39, Box 438 (1918). #13. See also Data for Annual Report, Bureau of Construction and Repair, 1918, 181-39, Box 438, #13; Data for Annual Report, Bureau of Construction and Repair, Jul. 18, 1919, 181-39, Box 557, #13. For histories of specific ships, see DANFS.

Table No. 7: TOTAL VESSELS DRY-DOCKED, BOSTON NAVY YARD, 1910-1934



base for four vessels of Squadron Two, Cruiser Force, Atlantic Fleet, and in 1917 and 1918, nine additional cruisers received repairs at Boston. Salem remained in the yard for almost a year, while the Machinery Division removed her original turbine engines and replaced them with General Electric units. Tacoma, Albany, Cleveland, and several other cruisers the yard worked on escorted convoys between the United States and Europe, and Chicago was flagship with the Atlantic Submarine Force.

During 1917 and 1918, fifty different destroyers came to the Boston Navy Yard. New vessels, such as Little, Manley, Stringham, and Gregory, were received from their contractors, placed in commission, outfitted, and made ready for service. That work often included installation of batteries, searchlights, depth charge gear, radio compasses, fire control equipment, and listening devices. Destroyers already in commission underwent a variety of repairs at the yard. The entire bow of Roe was renewed in only four days, earning a "well done" from the Secretary of the Navy.[74] The yard arranged, rearranged, and modified antisubmarine devices in Aylwin, used by the Navy to develop equipment and techniques in the war against U-boats. The overhaul of Drayton included lifting and resetting guns, refitting lights and torpedo firing gear, and work on machinery. Drayton, joined by Conyngham, and McDougal, both also at the yard, sailed on April 24, 1917, for the war zone and were among the first of six American destroyers to report for duty at Queenstown, Ireland. In the following months, thirty additional

74. Special Order No. 55, Jun. 28, 1917, 181-39, Box 325, #11711.

Table No. 8: DRY-DOCKINGS, BOSTON NAVY YARD, 1914-1920, BY SHIP AND VESSEL TYPES

	1914	1915	1916	1917	1918	1919	1920
Battleships	10	13	6	8	12	14	4
Cruisers	4	6	4	9	10	3	1
Destroyers	14	20	33	30	23	48	32
Submarines	3	3	6	9	13	25	15
PGs & Other Small Warships	4	6	5	10	28	14	7
Minelayers & Minesweepers	0	0	1	2	5	11	0
Transports & Cargo Ships	0	1	0	5	9	5	10
Oilers & Colliers	1	2	2	1	3	1	5
Other	5	2	16	10	20	36	31
Tugs	5	7	6	6	11	9	10
Other Yard Craft	13	5	13	10	8	11	31
Treasury Department	2	5	9	2	2	3	4
Dry Dock No. 1	26	34	45	48	90	79	39
Dry Dock No. 2	35	36	56	34	50	79	40
Commonwealth Dock (DD No.3)	--	--	--	--	--	2	25
Marine Railway	--	--	--	--	--	20	46
Commercial Docks	0	0	0	1	2	0	0
Dock Not Recorded	0	0	0	19	2	0	0
TOTALS	61	70	101	102	144	180	150

(SOURCE: Docking Log, 181-60)

destroyers arrived at Queenstown, among them a number fresh from the Boston yard, such as Benham, Jacob Jones, Patterson, and Wainwright. Early in 1917, the Boston yard made major repairs on Melville, a destroyer tender assigned to Queenstown.

Twenty-three submarines received the attention of the Boston Navy Yard during the two years of war. The yard placed in commission M-1 and three vessels of the "O" class, performing minor alterations and repairs and providing outfits. Slight work was done on H-11, H-12, and H-14, which were being transferred to the British fleet. After H-15 sank at the Fore River plant, she was raised, towed to Boston, and her main engines and batteries overhauled by the Machinery Division. Most American submarines patrolled the East Coast during the war, but some of the "K" and "L" classes were ordered to European waters.

An American contribution to the Allied cause was the design and manufacture of more than 400 submarine chasers. These 110-foot, wooden-hulled vessels were constructed by small yacht and boat builders in the nation. George Lawley and Sons of Neponset, south of Boston, built eighteen submarine chasers, all of them commissioned at the Boston Navy Yard and equipped there with three-inch guns, machine guns, depth charge projectors, listening devices, and other equipment.[75]

Although the Boston yard labored prodigiously on warships, it exerted even greater efforts in preparing civilian vessels for war. There were several different categories of these ships and boats: vessels acquired by the Navy for district and harbor

75. DANFS, vol. VI, pp. 711-2, 722.

patrol; similar craft converted for distant service; merchantmen being provided by the government with armed guard equipment; and merchantmen and passenger vessels leased, purchased, or otherwise acquired by the Navy, including self-interned German ships seized by the United States.

Between July 1, 1917, and June 30, 1918, the Boston Navy Yard performed or supervised the conversion of 149 vessels for district and harbor service. Many of these were small, such as the fifty-one-foot motor boat Nelansu and the fifty-eight-foot Eleanor. However, this category also included substantial ships. Old Colony had a length of almost 400 feet. Conversion often involved dry-docking, overhauling and repairing engines and boilers, fitting guns and magazines, and installing heating devices. Similar work was undertaken on nine vessels judged more seaworthy and suitable for distant patrol work. For example, Aloha, a 218-foot yacht, built in 1910, was leased to the Navy in April 1917, commissioned in June, and first served as a patrol vessel in the Third Naval District. Beginning in September 1917, she was the flagship of the Inspector of Naval Districts, Atlantic Coast, and cruised from Maine to Texas on inspection tours. After her conversion, the yacht Aztec convoyed submarines from Boston to New London and troop ships from Boston to Halifax. In the last stage of the war, Aztec patrolled the Grand Banks off Newfoundland.

Arming American merchantmen began in March 1917, and the Boston yard installed "armed guard equipment" on seven vessels belonging to steamship companies. The same installations had to be made on some vessels newly acquired by the Navy. Among these

were merchantmen of the "Lake" class. Because of the deficiency of the American merchant marine, the United States Shipping Board made contracts with a number of shipbuilding firms, mainly in the Great Lakes area, for construction of a fleet of moderate size vessels. Before their completion, many of these ships were taken over by the Navy. Nine were sent to Boston for commissioning and outfitting. Twenty-five other leased or purchased freighters were also commissioned, repaired, outfitted, or converted by the Boston Navy Yard.

The most extensive conversions performed by the yard changed two former coastal passenger steamers, Oglala and Bunker Hill into the mine planters Shaumut and Aroostook. Consuming 213 days for each ship, the conversions involved major repairs to main engines; rebuilding main condensers; retubing boilers; modifying and repairing oil-burning equipment; installation of new ice and distilling plants; fitting radios and gyrocompasses; building mine decks; rearranging living spaces; and installing mine-handling gear, deck winches, and windlasses. Yard officers declared the conversion of the two ships as "undoubtedly the most extensive alteration and repair job ever undertaken at the Boston Navy Yard." Shaumut and Aroostook left Boston for Europe on June 12, 1918, and assisted in maintaining the North Sea Mine Barrage.

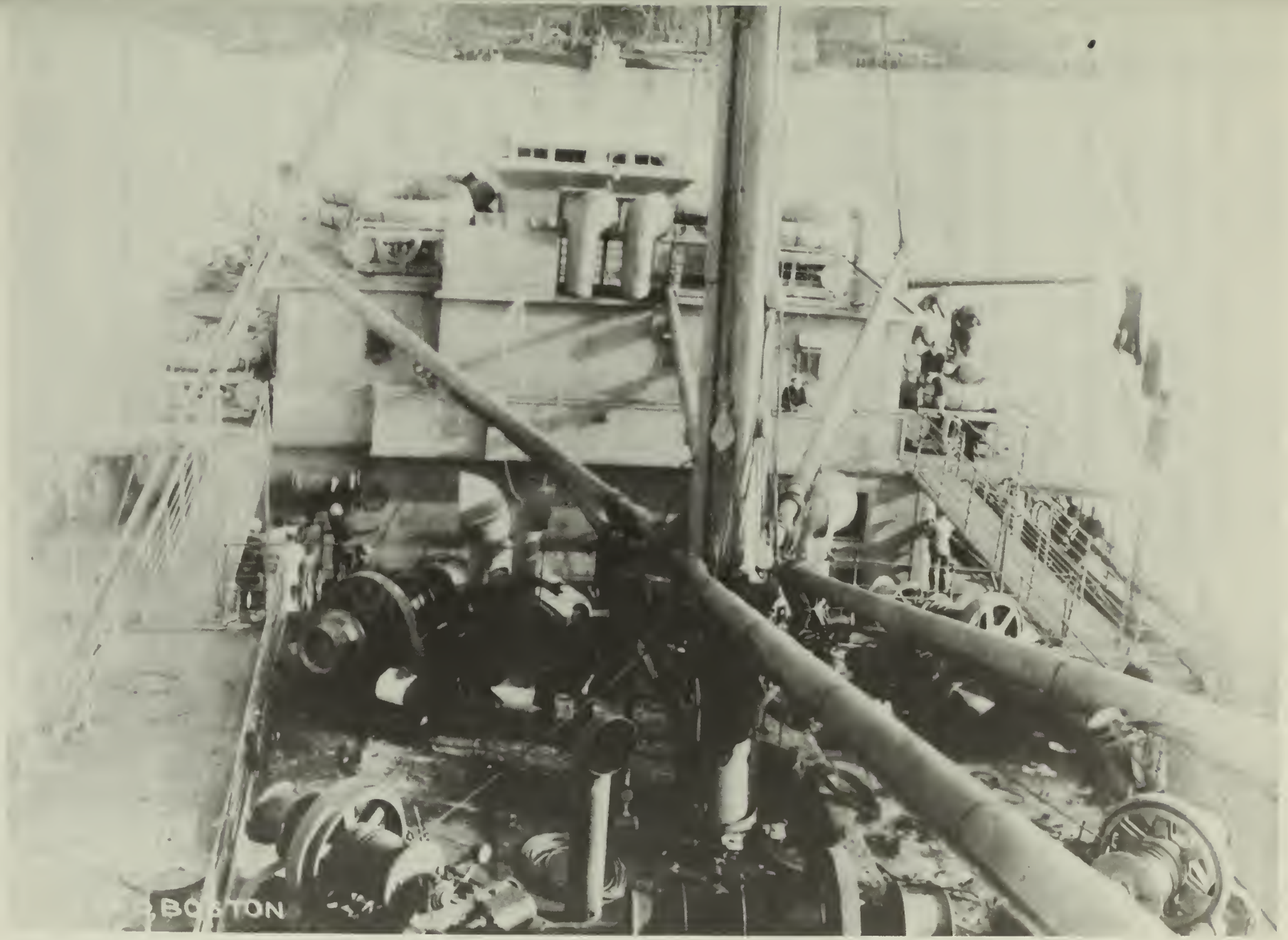
Next to the two mine planters, the yard's largest conversion work during World War I centered on five German vessels seized by the United States shortly after the declaration of war. At that time, three German passenger liners with their crews were in the port of Boston, having been the focus of attention of the destroyers on neutrality patrol and inspected daily by the yard

PHOTOGRAPH NO. 9: USS Aroostook, at the Boston Navy Yard, June 7, 1918, near the end of its conversion and fitting out as a mine layer.

tug. As occurred on other ships of the Central Powers self-interned in American waters, the German crews, knowing the fate of the vessels when the United States entered the war, damaged engines, boilers, valves, and piping. The three vessels were formally seized in late June 1917. Sailors and marines of the battleship Virginia, then in the Boston yard, took part in that operation. The three liners were Amerika, Cincinnati, and Kronprinzessin Cecilie. In addition, the Boston yard also worked on two other German ships seized elsewhere, Breslau and Saxonia.

At the time of the confiscation, the construction officer recommended that the three liners be converted at private yards, because of the necessity to use all navy yard labor in work on warships. However, each of the three liners measured more than six hundred feet in length, Kronprinzessin Cecilie being 706. The only dry dock in Boston Harbor capable of receiving the vessels was the navy yard's Dock No. 2. The liners remained at the yard, and the conversion undertaken by yard employees and the workers of private companies under the supervision of the Manufacturing Department. Special problems arose because of the size of the ships, the deliberate damage inflicted to them, and the absence of plans for guidance. Essentially, the vessels' machinery had to be repaired and structural changes made to convert them to troop ships. The latter task required work on galleys, providing sick bays, installing the proper number and type of life boats and rafts, and rearrangement of living quarters. In addition, Kronprinzessin Cecilie was found to be in need of extensive dry dock repairs.

By arranging employees in shifts and prosecuting the work



PHOTOGRAPH NO. 10: The former German liner Amerika at the Boston Navy Yard, October 17, 1917, after its conversion as a troop transport.

twenty-four hours a day, the yard completed the conversion of the liners in three months. Kronprinzessin Cecilie was commissioned Mount Vernon; Amerika, America; and Cincinnati, Covington. The transports immediately entered service, carrying troops from the United States to France. In nine round trips, America transported almost 40,000 men to Europe.

The Boston yard also converted two other seized German ships. Breslau became the torpedo boat repair ship Bridgeport and Saxonia, the submarine tender Savannah.

During the World War I era, the Boston Navy Yard built several ships. Although some steps were taken to enable the yard to construct battleships, the Navy Department designated Boston as a repair facility, with a secondary role of building auxiliaries. Once the yard began to experience the demands of war, new construction was postponed in favor of more urgent tasks.

In March 1913, Congress authorized the construction of Supply Ship No. 1, the first vessel specifically built to carry supplies and provisions for the Navy. After the appropriation, the Navy Department prepared plans and specifications, which were sent to would-be bidders. The Navy permitted its own yards to seek the contract in the same fashion as private firms. Bids were received from several yards, Boston among them, as well as from major private shipbuilders, namely New York Shipbuilding, Seattle Construction and Dry Dock, Fore River, William Cramp, and Newport News Shipbuilding. The lowest bid came from the Boston yard, and on February 19, 1914, the Navy Department issued directives for the construction of the vessel.[76]

The Boston yard had campaigned for the contract. Since May

1913, administrators of the yard had expressed concern over the prospect of the lack of work during the remainder of that calendar year and into 1914. In August, thirty-five men were laid off from the shipfitters shop, and forty more were furloughed for fifteen days in September. Because nothing had changed during the furlough period, at its end, the men were discharged. Indeed, further reductions in the labor force were projected for 1914.[77]

The concern was not limited to the yard officers, but was also felt by the employees, and, indeed, by the Boston community. A "Build-a-Ship-at-Boston" movement emerged with headquarters at 665 Washington Street, Boston, to mobilize pressure on the Navy. A conference was held, letters written, and doubtless congressmen and senators contacted. Representatives of all of the trades in the yard signed a resolution adopted at the conference, pledging the cooperation of workmen in building the ship on time and within the costs specified. Also they agreed to the implementation of a "contract or piecework system, the same as that in operation at the Brooklyn Navy Yard.[78] Ten days after the letter was sent, the Navy Department notified the Boston yard of its decision.

Construction of the supply ship required extensive

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76. ARND, 1914, pp. 269-70.

77. Actual and Prospective Work, Boston Navy Yard, Oct. 7, 1913; Actual and Prospective Work, Boston Navy Yard, Oct. 1913; Probable Reduction in Force of Hull Division, Dec. 16, 1913; Commandant to Secretary of Navy, Dec. 16, 1913, all in 181-39, Box 133 (1914), #16.

78. To Josephus Daniels, Feb. 9, 1914, 181-39, Box 227 (1915), #16; ARND, 1914, p. 253.

preparations. In June 1914, Congress made $148,000 available for a building slip and plant improvements. Bids were solicited for the slip and for materials to be used in constructing the vessel. Drafting work at the yard began in February 1914 and mold loft work the following May. In the meantime, the building slip was completed and the ship cranes installed. Shop work commenced in April 1915, and the keel was laid June 13, 1915. The supply ship, named Bridge, was launched on June 13, 1916 and was placed in commission on June 2, 1917.

At the time the largest steel ship built at the Boston Navy Yard, Bridge had a length of 423 feet, a breadth of fifty-five, and a draft of twenty feet. She was fitted for carrying and handling miscellaneous cargoes, including fresh foods, for which refrigeration had been provided. Bridge had twin propellers, powered by reciprocating engines, with boilers designed to burn either fuel oil or coal. Although the cost of labor and materials rose significantly in the several years after award of the contract, the yard completed the vessel within the estimate of $1,425,000. During 1917 and 1918, Bridge made four round trips across the Atlantic as a unit of the Naval Overseas Transportation Service.[79]

In 1915, the yard won another contract, this one for building a torpedo testing barge. Actual construction began in May 1916, but the demands of war postponed completion until

79. Commandant to Mayor Curley, Jun. 14, 1917, 181-39, Box 367, #411; Special Order No. 25, May 8, 1916, 181-39, Box 281, #11711; General Order No. 212, May 2, 1916, in General Orders of Navy Department, 1913-1917; Annual Report of Bureau of Construction and Repair, Jul. 1, 1916, 181-39, Box 285, #13.

September 1918. One hundred and thirty-five feet long and forty-nine wide, the three-decked barge was equipped with three torpedo firing tubes, apparatus for handling and repairing torpedoes, and the necessary electrical and steam power. It had accomodations for ninety-three officers and men. The function of the vessel was to train men in the care and operation of torpedoes and to adjust torpedoes and test their accuracy. Upon completion, the barge was transferred to the Naval Torpedo Station at Newport.[80]

In July 1916, Commandant Rush explained to the Bureau of Construction and Repair that the yard needed additional new construction, since the steel work on Bridge was "far advanced," leaving only the work on the barge, "which is well under way." Soon the mold loft, bending slab, angle shop, and anglesmith shop would be idle. To hold together the work force, Rush sought the assignment to the yard of construction of a fuel ship to be authorized in the pending naval appropriations bill. The commandant claimed that the process of submitting detailed estimates would cause too long a delay, and he hoped the award could be made without a formal bid. On August 29, President Wilson signed the navy bill, which included authority and funds for a major naval building program, including three fuel ships, "one at a cost not to exceed $1,500,000, to be begun as soon as possible." Six days before the bill became law, the Navy Department had obliged the request of the Boston commandant and assigned to his yard the contract for the fuel ship. In 1918,

80. Commandant to Bureau of Steam Engineering, n.d., 181-39, Box 431 (1918), #13; Commandant to Mayor Curley, June 14, 1917, 181-39, Box 367, #411.

the yard also received the contracts for the two other fuel ships.[81]

Rush's lament in July 1916 that the yard lacked work was the last such complaint until after the war. Soon the yard was caught in a whirl of activity. Construction of the first fuel ship, named Brazos, required extending the shipbuilding ways. That project and the growing demands on the yard resulted in postponement of the laying of the keel until June 1917. Progress continued to be slow. Workmen who might otherwise have been assigned to new construction were needed for urgent repairs on existing ships. Delays also resulted because the yard lacked the capability to roll the vessel's shell plating, and the plates had to be shipped to the navy yard at New York to be worked. Further difficulties arose because of a contractor who could not deliver a low-pressure cylinder acceptable to the Navy. The Machinery Division at the yard undertook the casting of that fourteen-ton component. Brazos was finally launched in May 1919 and placed in commission in the following October, nearly a year after the date stipulated in the original contract.[82]

The delay appears understandable. The yard previously functioned almost exclusively as a repair facility, except for the construction of the tug Pentucket, the training ship Cumberland,

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81. Commandant to Bureau of Construction and Repair, Jul. 22, 1916, 181-39, Box 290, #19-3; P.L. 241, Aug. 29, 1916, SAL, vol. XXXIX, p. 616.

82. Data for Annual Report, Construction and Repair, Aug. 23, 1918, Box 438, #13; Commandant to Bureau of Steam Engineering, Jun. 10, 1919, 181-39, Box 557, #13; Commandant to Bureau of Construction and Repair, Jul. 12, 1920, 181-39, Box 671, #13.

and the supply ship Bridge. More significantly, the unparalleled demands arising from World War I absorbed the yard's resources and prevented zealous prosecution of new construction. In this respect, the First World War differed from the second, when the yard both repaired and constructed ships.

POSTWAR YEARS, 1919-1920

The Boston Navy Yard remained on a wartime footing for at least a year after the fighting ceased in November 1918. The yard logged 180 dry-dockings in 1919 and 150 in 1920, both exceeding the years of the actual conflict and considerably higher than the prewar period. The labor force continued to expand until February 1919, when it numbered almost 13,000. Thereafter, it contracted, 5000 workmen being laid off by the end of 1919 and 2000 more by the end of 1920. At that time, the yard still employed more than triple the number of workers it had in 1914.

Navy yards remained active in the two years after the armistice because of several circumstances. The fleet continued to acquire new warships, appropriated in 1916 and built under contract with private firms. From the Bath Iron and Fore River plants, destroyers and submarines arrived at Boston to be put into commission and outfitted. Also, it was not until after the war that deliveries began from the huge Squantum plant. This facility, owned by the Navy and operated by Bethlehem Shipbuilding, had been constructed during the war for the fabrication of destroyers. Completed in May 1918, it delivered

its first ship in late November of the same year. By May 1920, when operations ceased, it had built thirty-three destroyers, some of which arrived at Boston for outfitting and commissioning.[83]

Not only the acquisition of new ships, but the removal of vessels from Navy service meant work for navy yards. The end of the war eliminated the need for the hundreds of small ships and boats obtained for district and harbor patrol. These were returned to their former owners or otherwise disposed of. Also, the Navy sold many of its 110-foot submarine chasers to private parties. Before any of these vessels could be relinquished, however, their military equipment had to be removed. This included guns, gun mounts, depth charge apparatus, listening equipment, radios, and most of the other gear with which the Navy had outfitted them. Stripping vessels of such equipment was a task performed at various navy yards, including that at Boston.

In the immediate postwar era, the Boston yard continued to make conversions. At the outset of the conflict, the Navy altered civilian ships into mine planters. War's end left those vessels without practical purpose. However, other types of ships were in great demand, especially minesweepers and troop transports. The armistice found more than two million American military personnel in Europe. More than half of them had arrived there in British transports. When the war ended, the British government made few of its ships available to aid in returning

83. Activities of the Bureau of Yards and Docks, World War I, p. 218.

Yanks. To develop the capacity for carrying a huge number of men, the Navy outfitted a variety of vessels as troop transports. The Boston Navy Yard, for example, converted the mine planters Canandaigua, Canonicus, and Housatonic into transports. Battleships, including those of the Virginia-class, were equipped with additional berthing and messing facilities and made numerous trips back and forth across the Atlantic. One of the vessels engaged in the transport service was Mount Vernon, the former German liner. In the September before the armistice, having completed nine crossings carrying troops to France, the ship was torpedoed some 200 miles off the French coast. She managed to return to Brest for temporary repairs. Sailing under her own steam, Mount Vernon proceeded to the Boston Navy Yard, arriving on October 29. During the next four months, the yard made permanent hull and general repairs and expanded the troops spaces. In March 1919, the ship resumed services as a transport.[84]

Other ship work at the Boston Navy Yard in the two years after the war consisted of new construction. Brazos, Fuel Ship No. 16, started in 1917, was launched in May 1919 and delivered to the Navy on October 30 of the same year. The first of three oilers built at the yard, Brazos was 475 feet long, fifty-six in breadth, and had a draft of almost twenty-seven feet. With a displacement of 5723 tons, the vessel and her two sisters were the largest ships built at Boston, except for the destroyer tender Whitney.

In July 1918, the yard was awarded the contracts for Fuel

84. Data for Annual Report, Bureau of Construction and Repair, Jul. 31, 1919, 181-39, Box 557, #13.

Ships Nos. 17 and 18, named Neches and Pecos. The demands of war meant that little progress was achieved until the end of the fighting in Europe. The keel of Neches was laid in June 1919, the ship was launched a year later, and she entered commission in October 1920. The work on Pecos was generally a year behind that on Neches, and the third tanker was commissioned in August 1921. The yard received the contract for yet another vessel in December of 1919. That was for Whitney, and, although actual construction did not start until April 1921, the yard nevertheless was engaged in building three ships at the same time, certainly an unusual circumstance and not seen again until the era of World War II. The new construction provided the yard with work at a time when the volume of repairs slumped and probably eased the return to peacetime conditions.

In 1919 and 1920, as before and during the war, the Boston yard's primary function was the repair of warships. Being the most common ship in the Navy, destroyers provided the bulk of work for the yard. In fiscal 1920, Boston repaired sixty-two destroyers. On the average, fourteen of those vessels arrived in the yard each month. During the same year, the yard worked on twenty-eight submarines. Most of the battleships coming to the yard at that time were of the pre-Dreadnought type and nearing the end of their careers. Virginia and New Jersey steamed into the yard in June and July 1919 and remained for the next four years. Decommissioned in 1920, they were transferred to the War Department in the summer of 1923. Subsequently, the army used them as targets off Cape Hatteras in Brig. Gen. William Mitchell's

demonstration of aerial bombing. In the early summer of 1919, the yard prepared Rhode Island and Georgia for their voyage to the West Coast, where they too went out of commission. Some work was done to battleships remaining on active duty. Shortly after the armistice, Delaware and Kentucky were overhauled, and in 1919 and 1920, North Dakota and Utah occasionally entered the yard between maneuvers and battle practice off the Atlantic Coast.[85]

Measured by prewar standards, the Boston Navy Yard performed a fairly heavy volume of repairs in the years immediately after the armistice and worked on 169 different vessels in the twelve-month period ending July 1, 1920.

During World War I, important developments occurred respecting the physical plant of the Boston Navy Yard. Several of these projects did not achieve completion or realization until after November 1918. Among permanent changes were the building of a marine railway and the acquisition by the Navy of the Commonwealth Dock at South Boston, which became an annex of the Boston Navy Yard. The yard was also assigned temporary custody of several other properties in the area belonging to the Navy.

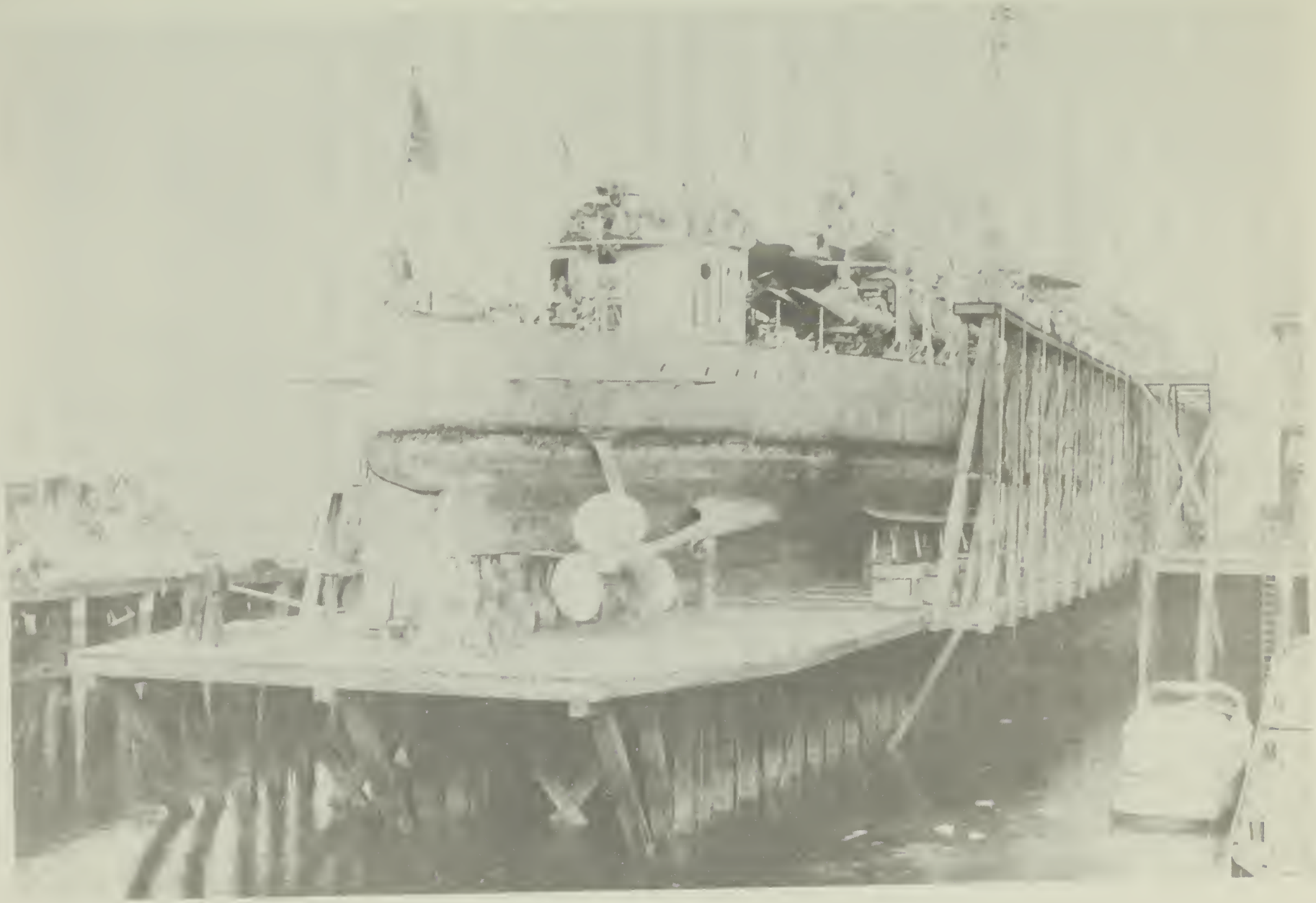
A marine railway, or hauling-out ways, is a mechanism for exposing the underwater portions of small ships and boats. Essentially, it consists of an inclined railway projecting into

85. For information about ship work during the years 1919 and 1920, see Commandant to Bureau of Steam Engineering, Jul. 10, 1919; Commandant to Bureau of Construction and Repair, Jul. 31, 1919, both in 181-39, Box 557, #13; Commandant to Bureau of Construction and Repair, Jul. 12, 1920; Commandant to Bureau of Steam Engineering, Jul. 13, 1920, both in 181-39, Box 671, #13; Commandant to Bureau of Engineering, Jul. 11, 1921; Commandant to Bureau of Construction and Repair, Jul. 12, 1921, both in 181-39, Box 752, #13.

the water and on which travels a cradle with an endless-chain arrangement. In "docking," the cradle is run down the rails into the stream and the vessel maneuvered to a position where the hull can be secured to the cradle and hauled out of the water. A marine railway serves the same purpose as a dry dock. When the new facility at the Boston yard went into service, it first was designated "Dry Dock No. 3" and its operations were recorded in the Dry Docking Log. In 1920, the newly acquired dock at South Boston became "Dock No. 3," and the marine railway renumbered "No. 4." During World War II, it received the designation "Marine Railway No. 11."

Marine railways were in common use, and in Boston Harbor at the time of World War I, there were approximately ten such devices at private yards. A small, nineteenth-century marine railway had existed at the west end of the navy yard before the development of the Fitchburgh Slip and the modern Wharf No. 1. Upon its removal, the yard had no facility specifically for hull work on small vessels. Very light craft were occasionally lifted by the 150-ton crane. However, in the normal course of events, work on tugs, coast guard cutters, torpedo boats, and other small vessels required the services of one of the dry docks. The utility of a marine railway became clear in 1917, when the Navy acquired hundreds of patrol craft and a large number of submarine chasers.

In response to that need, Congress in October 1917 made funds available for a marine railway at the Boston yard. Similar facilities were also planned for naval installations at



PHOTOGRAPH NO. 11: USS Delphy on the marine railway, Boston Navy Yard.

Charleston, Newport, San Diego, and Pearl Harbor.

Crandall Engineering Company of East Boston designed and built four of the Navy's new marine railways, including the one at Boston. Construction at the yard began in June 1918, the site selected being between the two dry docks. Completed in somewhat less than a year and at a cost of $210,000, it was placed into service on June 9, 1919. The new facility had a 382-foot long cradle and could haul out vessels of up to 2000 tons.[86]

Beginning on June 11, the new plant was in almost continuous service. On September 29, 1919, it hauled out its first major warship, the destroyer Delphy, which was 314 feet long and had a displacement of 1190 tons. Delphy remained on the marine railway for a month, being readied to sail to San Diego. During its first year of service, "Dry Dock No. 3" hauled out tugs, patrol vessels, destroyers, submarine chasers, and a floating derrick. In fiscal year 1920, the marine railway was in use 124 days, considerably less than either dry dock. Nevertheless, it had established itself as an important addition to the yard.[87]

During World War I, the Navy acquired a number of sites and facilities in the Boston area, several of which became temporarily or permanently attached to the Boston Navy Yard, namely the Squantum destroyer plant, Lockwood's Basin, a coal depot at

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86. Commandant to Bureau of Construction and Repair, Jul. 31, 1919, 181-39, Box 557, #13; ARND, 1920 (FFS #7495), pp. 9, 428; AREO, 1920, 181-39, Box 671, #13; Mary Jane Brady and Crandall Dry Dock Engineers, Inc., Historic Structure Report, Marine Railway No. 11: Architectural Data Section (Denver: National Park Service, 1982), pp. 5-9.

87. Data for Annual Report of Bureau of Construction and Repair, Jul. 12, 1920, 181-39, Box 671, #13; Docking Log, 181-60.

South Boston, and the Commonwealth Dock, also at South Boston.

An act of Congress in October 1917 authorized the development of a permanent destroyer construction facility on a tract five miles north of Quincy and at the mouth of the Neponset River. When completed the following July, the Squantum plant consisted of a huge, eighteen-acre fabrication and assembly shop, with ten building slips, all under roof; six wet basins, also roofed; and auxiliary shops, storehouses, launching ways, railway connections, wharves, and all else needed for rapid construction of destroyers. Bethlehem Shipbuilding Corporation built and ran the plant, completing thirty-three ships by May 1, 1920, when operations ceased. One month later, the commandant of the Boston Navy Yard accepted custody of the ninety-seven-acre facility, which thereby became an adjunct of the Boston Navy Yard. Designated the United States Destroyer and Submarine Base, Squantum, Massachusetts, the plant was intended to become a repair yard for destroyers and submarines. In the early 1920s, the Navy used Squantum for storage of surplus materials, small crafts, and other items. Until 1924, when leased to a private party, the inoperative facility was in the administrative and custodial charge of the Boston Navy Yard.[88]

Lockwood's Basin included one large and four small buildings, a marine railway, and a pier, all occupying a 180-foot by 230-foot piece of land on the waterfront of East Boston and about 500 yards from the Boston Navy Yard. During the war, the large structure had housed as many as 1200 enlisted men, and the

88. Activities of the Bureau of Yards and Docks, World War I, p. 219; AREO, 1920.

rest of the facility served as a base for small boats of the First Naval District. As of September 6, 1919, Lockwood's Basin became an annex of the Boston Navy Yard, but was used solely as a meeting place of the Naval Reserve Force of the First Naval District.[89]

During the war, especially the winter of 1917-1918, a shortage of coal on the East Coast threatened to cripple industry and shipping. To protect itself against such shortages, the Navy acquired five emergency coal depots, one of which was on land belonging to the Commonwealth of Massachusetts in South Boston and adjacent to an existing coal plant, operated by the Metropolitan Coal Company. When receiving coal, the Navy plant used the Metropolitan towers and part of its cableway trestle. Coal was dumped and then spread by locomotive cranes at ground level. In issuing the fuel, the same cranes loaded it into barges. In July 1920, the depot became attached to the Naval Dry Dock at South Boston, which itself had been annexed two months earlier to the Boston Navy Yard.[90]

The Boston Navy Yard did not carry on any of its industrial operations at the Squantum plant, Lockwood's Basin, or the fuel depot. Inclusion of those sites as parts of the navy yard involved the Public Works, but not the Industrial Department. Although the commandant had formal custody of them, the three locations had little impact on the administration or the

89. AREO, 1920; Commandant, Boston Navy Yard to Commandant, First Naval District, May 21, 1920, 181-39, Box 655, #11.

90. AREO, 1920; Activities of the Bureau of Yards and Docks, World War I, pp. 347-8.

activities of the yard. Different circumstances prevailed concerning the Naval Dry Dock at South Boston, formerly the Commonwealth Dock. That facility was the yard's most important plant improvement of the World War I era and became a permament part of the operations of the Industrial Department.

The dry dock at South Boston had its genesis in the early twentieth century, when the Commonwealth of Massachusetts embarked on a program to develop the port of Boston. That program included providing docking and repair facilities for large commercial liners. To that end, the state undertook the construction of a dry dock on a site at the South Boston waterfront and adjacent to the Commonwealth Pier. The projected Commonwealth Dock contributed to the decision of the Navy not to build a third dock at the Boston Navy Yard, but to make arrangements with the state for the use of its dock on a priority basis, especially in time of war. Knowing of the Navy's interest and assured of an annual payment of $50,000 for twenty years by a coalition of three steamship companies, the Directors of the Port of Boston in December 1912 voted $3 million for construction of a dry dock of sufficient size to accomodate any steamship in the world.[91]

Actual construction of the dry dock did not commence until 1917. In March of that year, Congress empowered the Secretary of the Navy to make a six-year contract for the use of a dock at Boston at a compensation of $50,000 per year, with the stipula-

91. Report of the Directors of the Port of Boston, 1913, 181-39, Box 152, #6.

tion that construction begin immediately and that it be completed within two and a half years. The exigencies of war and the slow progress in the building of several new docks at navy yards promoted further action by Congress. In October 1918, legislation passed authorizing the purchase by the United States government of the Commonwealth Dock, still under construction, and adjacent lands for no more than four and a half million dollars.[92]

The 1000-foot-long dock was completed in 1919 and tested on December 22 and 23 by Virginia, towed for that purpose from the navy yard. The state of Massachusetts and the Navy worked out terms for the final purchase, and the dock became part of the Boston Navy Yard on May 4, 1920. The full price was $4,258,385.58.[93] At the time of its completion, the South Boston dry dock ranked as the largest such facility in the world.

Annexation of the new structure by the Boston Navy Yard did not mean the development of a complete and independent repair facility. Rather, early plans for utilization of the annex assigned to it the docking of capital and other ships too large for the yard's Dock No. 2. Ordinary repairs usually associated with docking, such as cleaning and painting ships' bottoms, would be performed at South Boston, but all major items of work required by ships in the dock would be done at the navy yard. This included large forgings, boilers, shafting, and hull

92. P.L. 391, Mar. 4, 1917, SAL, vol. XXXIX, p. 1180; P.L. 223, Oct. 17, 1918, vol. XL, p. 1013.

93. AREO, 1920.

components, which would be repaired or produced at the main yard and sent to the annex by lighter for installation.[94]

After entering service in March 1920, the new dock was employed primarily for the docking of vessels of the United States Shipping Board, many of which could have been accomodated in either Dry Docks No. 1 or 2. During the calendar year of 1920, a fairly clear pattern emerged for the distribution of work between the Charlestown yard and the annex. Regardless of size, all warships were docked at the yard and most Shipping Board vessels at the annex. For example, on April 7, Dry Dock No. 3, as the new facility was now known, simultaneously received three Lake-class merchant ships. Generally, military vessels went to the yard. The only significant Navy vessel docked at the annex in 1920 was Brazos, the newly constructed fuel ship. In her previous docking, Brazos had entered Dry Dock No. 2, but in December 1920, she was docked at No. 3, probably because Utah occupied the larger dock at the main yard.[95] Except when three or four vessels were simultaneously docked, none of the ships at the annex remained in the dock more than three days. The brevity of usual dockings indicates that major repairs were not performed at the South Boston site. This resulted from the plan for utilization of the dock and also from the absence at the annex of the facilities and equipment needed to accomodate a ship and her crew for a longer period.

Within a few years, the policy respecting the South Boston

94. AREO, 1920.

95. See Docking Log, 181-60.

Annex changed. With funds provided by Congress, the dock began to acquire cranes, a sewage disposal system, several shop buildings, and some of other appurtenances required for a modern industrial marine facility. However, the full development of South Boston did not come until World War II.

Chapter V

THE YARD IN DECLINE: THE TWENTIES

Both the Navy and the Boston Navy Yard suffered a decline in the 1920s. A reaction against America's participation in World War I included a rejection of Wilson and his policies, such as naval expansion. A new party in power gave priority to the nation's big businesses and argued that the economy would be better served by expenditures by private enterprise rather than allocations of large sums by government on the military establishments and for other purposes. The Five Power Naval Treaty, negotiated in the winter of 1921-1922, set limits on the size of the American fleet, and the administration allowed the Navy to fall well below treaty strength. Fewer ships meant less work for navy yards.

It also suggested to some that there would be fewer yards. Shortly after the signing of the naval limitations agreement, a Boston newspaper raised the prospect of the government's closing the local navy yard. Although the Navy did not terminate any major industrial activities during the decade, it did close the yard at New Orleans. Moreover, the Navy Department showed a continuing concern with its excessive ship repair capability. For example, in 1925 the Chief of Naval Operations noted that "the work loads at none of the industrial yards during the past year have approximated more than one-half of the physical capacity of the plant." The CNO announced no measures to eliminate or reduce the Navy's unneeded plant, but held that "any expenditure of national funds which does not have a direct

bearing on the maintenance of the fleet is unwarranted and should not be incurred."[1]

ADMINISTRATION: THE RETURN OF THE MANAGER

The Republican administrations of the 1920's, beginning with that of Warren. G. Harding, pursued three interrelated policies of importance to the nation's navy yards -- fleet reduction, economy, and yard reorganization. No direct assault was made on the bureau system. The reorganization of the yards was achieved in 1921 through an order of the new Secretary of the Navy, Edwin Denby, which revived certain parts of the 1908-1909 scheme of Truman Newberry.

Secretary Denby directed the establishment in all yards of the position of "Manager." The manager, a member of the Construction Corps and thus responsible to the Bureau of Construction and Repair, headed an enlarged Industrial Department and had responsibilities over several areas. As implemented in the Boston Navy Yard, the 1921 plan sought greater coordination, not only through the revival of the billet of manager, but also by assigning to the construction officer and engineering officer functions transcending the cognizance of their own bureaus and divisions. In effect, the reorganization produced three new offices in the Boston yard, a Manager, a Production Superintendent, and an Engineering Superintendent. While retaining the basic form of Denby's order, the organizational structure of the yard was fluid during the 1920s,

1. Boston Traveler, Feb. 27, 1922, p. 12, 181-83; ARND, 1921 (FSS #8013), pp. 7-8; ARND, 1925 (FSS #8600), p. 82.

with frequent additions, deletions, or other alterations.[2]

The yard commandant continued as "the military and industrial head" and as "responsible for the administration of the yard and all industrial work." Early in the 1920s, the commandant had three principal aides: the senior aide, who was also captain of the yard; the manager; and a personal aide. As in the past, the captain of the yard handled matters more military than industrial. All industrial activity was in the charge of the manager. The personal aide was "available to assist the Commandant as may be directed," especially "relieving the Commandant of the detail of such work as does not come directly under the Senior Aid or the Manager."[3]

The 1921 reform primarily affected those parts of the yard involved in industrial and manufacturing activity and sought to produce a more expeditious and economical system for accomplishing work on ships. The new scheme did away with administrative distinctions between hull and machinery work, and shops were no longer identified as part of one division or the other. A merger was achieved by placing one officer, the manager, in charge of all ship work and by assigning new functions to the two officers, who under the prior system, directed one or the other division. According to a 1925 memorandum:

> the organization in the Industrial Department is based on the principle of having an inside superintendent

2. ARND, 1921 (FSS #8013), pp. 8-9; Commandant to Assistant Secretary of Navy, Aug. 16, 1921, 181-39, Box 747, #11.

3. Memorandum for the Commandant, n.d. [1925], 181-40, Box 32 (1925), OO/Simmers; Manager to Commandant, Mar. 6, 1929, 181-40, Box 151, A3-1.

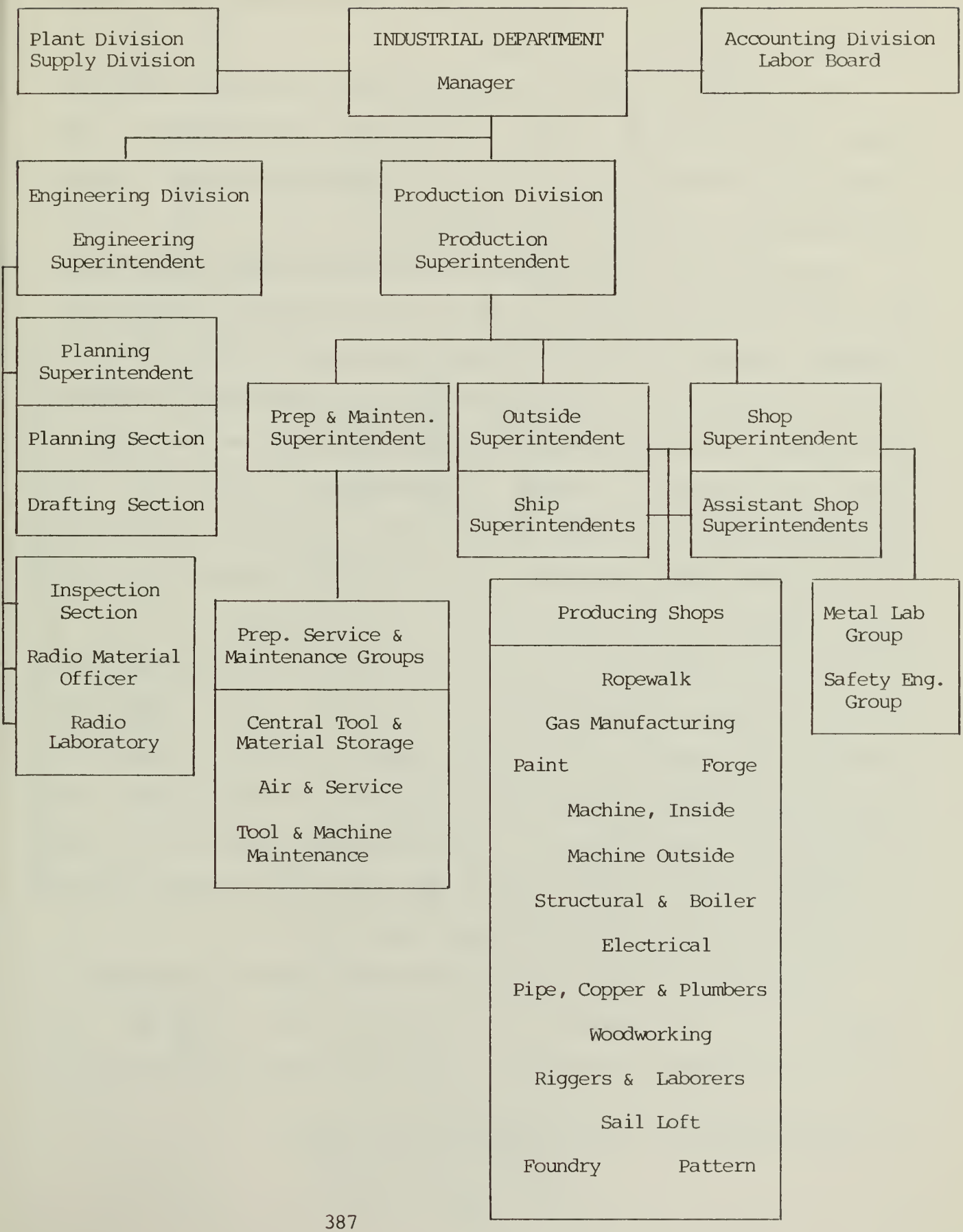
(Engineering Superintendent), who deals with all matters leading up to the authorization of work, and an outside superintendent (Production Superintendent), who is responsible for carrying out the work authorized.

Simple enough on paper, the system apparently had difficulty in its implementation.[4]

Selection of the titles "Engineering Superintendent" and "Engineering Division" proved unfortunate, requiring occasional notices to remind yard personnel of their proper meanings. Utilization of the term "engineering" probably resulted from pressure within the Navy Department exerted by the Bureau of Engineering and aimed at giving that bureau visibility in the administration of navy yards. In actuality, the Engineering Superintendent did not have charge of work in the yard under the cognizance of the Bureau of Engineering, but was a "planning" officer and would be formally designated as such in the 1930s. Contributing to the confusion in the postwar decade in the Boston Navy Yard was the fact that the Engineering Superintendent was the former Engineering Officer, who had headed the Machinery Division of the Industrial Department. Indeed, he continued to be the yard's senior officer with expertise in machinery. However, the Engineering Superintendent had responsibilities over both machinery and hull work, being essentially in charge of what previously had been designated as the "central office" and the "common agencies." The chief units of the new Engineering Division were the drafting room and planning section, material section, and inspection section. The Engineering Division had no shops and no firsthand direction of ship work. As the inside or

4. Memorandum for the Commandant, n.d. [1925].

Administration Table No. 4: BOSTON NAVY YARD, 1928 (INDUSTRIAL DEPARTMENT)



office superintendent, the Engineering Superintendent and his division performed all the paper work preparatory to and during the work on a ship.

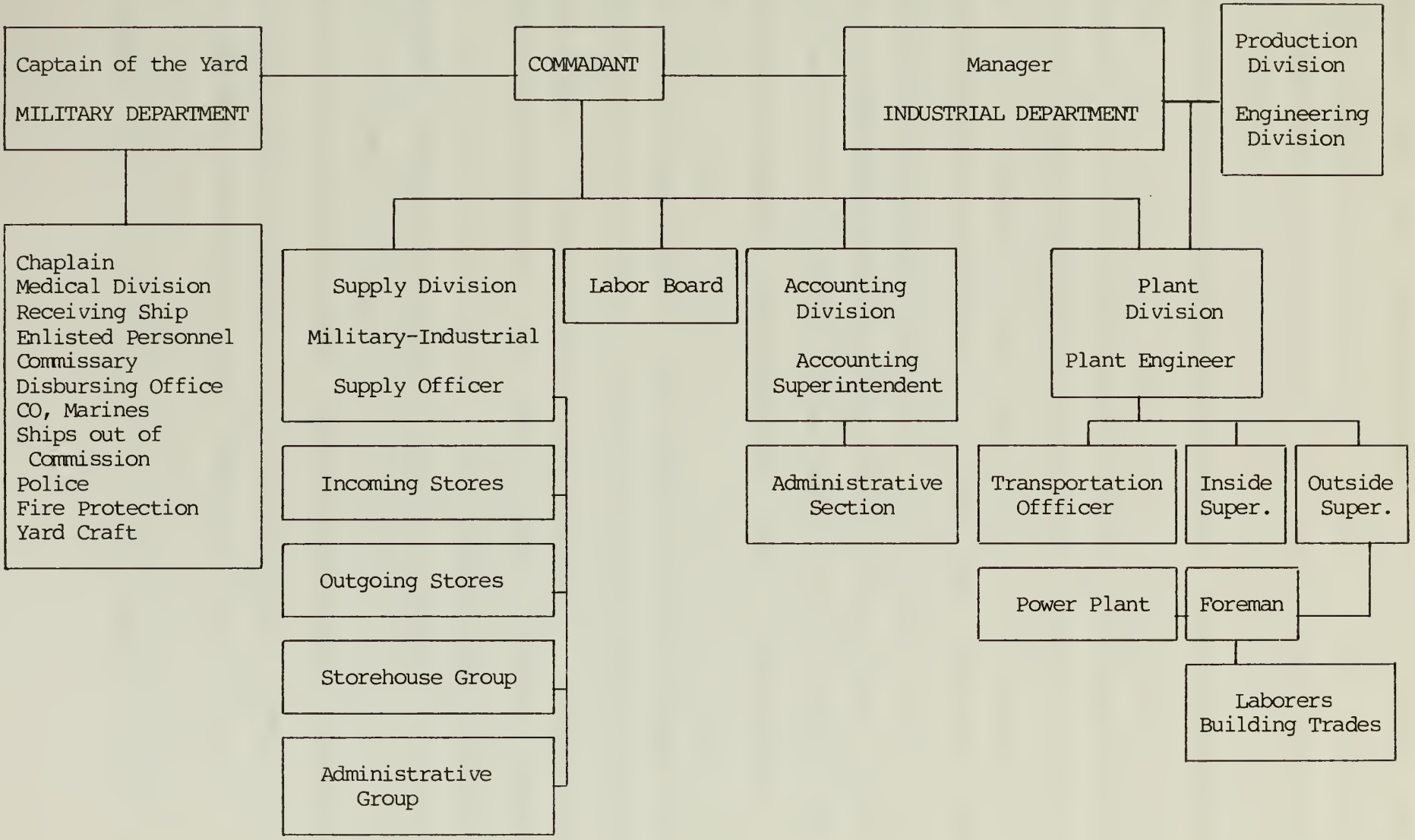
That ship work itself was done by the Production Division, under the direction of the Production Superintendent. The Production Division included all of the industrial shops, whether in buildings or on ships at the waterfront.

Under the 1921 reorganization, the Boston Navy yard achieved at least a partial merger of industrial activity. Distinctions remained between hull and machinery because of ties with the Bureaus of Construction and Repair and of Engineering. Moreover, the members of the Construction Corps persisted as a distinct group of officers, although the engineering officers had been amalgamated into the line. In the 1920s, it became customary for naval constructors to use the traditional navy ranks they held. Thus, "Captain C. M. Simmers, (CC)" was the Manager. Cdr. R. T. S. Lowell, an officer of the line restricted to engineering duty, was Engineering Superintendent, and Cdr. R. S. Hilliard, Construction Corps, was Production Superintendent. "Both the Engineering Superintendent and the Production Superintendent have officers of experience for both Engineering and C & R work assigned to the divisions, with the view of having the officer personnel in each division properly balanced."[5]

Manager Simmers had responsibility for units in the yard in addition to the Engineering and Production Divisions. His authority extended to the Plant or Public Works Department and to

5. Memorandum for the Commandant, n.d. [1925].

Administration Table No. 5: BOSTON NAVY YARD, 1928
(NONINDUSTRIAL UNITS)



the Accounting Department. Those two departments retained their own immediate heads, the Plant Engineer or Public Works Officer and the Accounting Officer. By 1925, the Supply Officer was also placed under the manager, to the extent his department was involved in ship work. Approximately eighty-five percent of the Supply Department's activities did not concern the yard's industrial activity and was conducted independent of the manager. Units not included in the manager's organization were the office of the captain of the yard, the disbursing officer, and the Medical Department. Essentially, the administrative organization of the Boston Navy Yard in the 1920s consisted of one large Industrial Department and several smaller departments and offices, most of them with narrow and specialized functions.

On November 1, 1925, the roster of permanent personnel at the yard totaled 2419 people, not including the Marine Corps unit and approximately thirty enlisted men. Among the roster's major groups were sixty-nine naval officers, 159 clerks, and sixty-seven draftsmen. The manual labor force consisted of 1851 men in the shops and 150 stockmen, stock laborers, and ordinary laborers in the Supply Department.[6]

Most of the yard's officers held positions in the Industrial Department. The office of the manager included a Navy lieutenant, with no duties other than assisting the manager. Twelve officers, twenty-five clerks, and sixty-three draftsmen were in the Engineering Division. Besides the Engineering

6. A table listing all positions in the yard is in U.S. Navy Yard, Boston, Organization, Nov. 1, 1925, 181-40, Box 1, A3-1.

Officer, the chief administrators were the Office and the Planning Superintendents.

The Production Division included twenty-two officers and an equal number of clerks, Important figures in that organization were the Production Superintendent, Outside Superintendent, and Shop Superintendent. The Outside Superintendent received assistance from ten officers who served as ship superintendents, having immediate charge of vessels under repair. Six officers and three civilian assistant shop superintendents aided the Shop Superintendent. Also in the Production Division were the Preparatory and Maintenance Section and the Safety Engineer Group, both headed by commissioned officers. No one had full-time responsibility for safety, the Safety Engineer himself being the Shop Superintendent and both his assistants holding other billets.

The Production Division included fifteen shops, and the Plant Division, three. No uniform organization prevailed among all shops, but most of them consisted of two sections. Supervisory mechanics, janitors, and miscellaneous workers, such as toolroom helpers, formed the "Shop Expense Group." The mechanics, helpers, and laborers actually engaged in ship work or manufacturing comprised the "Production Group." In the 1920s, it became common to refer to shops by their numbers. Those numbers were originally assigned by the Accounting Department as part of the effort to monitor costs. Production Division shop numbers bore the prefix "X." Thus, the Machine Shop, Inside, was X-31. Subunits within shops were numerically identified by adding

digits to the shop number. The shop expense group of the Machine Shop, Inside, included supervisors (X-319), a shop cleaning crew (X-3101), and a toolroom staff (X-3102).

Shops ranged in size from seventeen workers in the Sail Loft (X-74) to 493 in the Structural Shop (X-10). Group III mechanics outnumbered helpers (Group II) and laborers (Group I) in all but three shops, the Building Trades Shop (70) of the Plant Division, the Riggers and Laborers Shop (X-72), and the Ropewalk (X-97). In fact, except for those shops and the Supply Department, ordinary laborers seemed to be disappearing from the navy yard work force. This may be explained by the greater use of weight-moving equipment and of other labor-saving devices.

Since 1908, navy yard administrators had been encouraged to consolidate shops. Pursuit of that policy during and after World War I produced several new shops in the Boston yard. The Structural Shop (X-10) resulted from the amalgamation in September 1922 of the shipfitters, inside (X-11), shipfitters, outside (X-12), and boilermakers (X-41) and the addition in 1925 of the Sheet Metal Shop (X-17). Similarly, plumbers and coppersmiths merged into a single Pipe Shop (X-56), and the joiners, boat, shipwrights, and sawmill and spar shops into a single Woodworking Shop (X-61). The Preparation Service Shop had its origins in late 1921, with the creation of a central tool shop for the Production Division. That shop became responsible for the maintenance of machine tools, altering existing equipment, installing new machinery, and handling machine

breakdowns.[7]

One administrative innovation of the mid-1920s consisted of a weekly "Masters´ Conference," a meeting of the master mechanics with the commandant, manager, production superintendent, and other officers of the Production Division. The conference provided management with a means to communicate its decisions and policies respecting general and particular matters to the yard´s chief civilian supervisors. Minutes of each conference, recorded by the production superintendent, were distributed to all parts of the division.

The masters´ conference of November 20, 1925 had importance, since Rear Adm. Phillip Andrews had recently assumed command of the yard, relieving Rear Adm. L. R. De Steiguer. The conference gave Andrews an opportunity to direct attention to topics of concern to him. The administration announced the tentative decision to hold the dock and post-repair trials of Lark and Mahan on November 23 and 24 and that a new payday procedure would be implemented for members of the yard force engaged in the lengthy modernization of the battleship Florida. In the interest of efficiency and saving of time, such employees would be paid aboard the vessel, thus insuring only a brief interruption in their work. Utah was expected to arrive soon at the South Boston Annex, and masters in charge of work to be performed on the vessel while in Dry Dock No. 3 were urged to expedite that work in order that the ship could be transferred to the main yard,

7. Order No. 227, Mar. 24, 1925, 181-40, Box 2, A3-1; Order No. 79, Dec. 6, 1921, 181-40, Box 405 (1936), A2-5; Commandant to Bureau of Navigation, Feb. 14, 1920, 181-39, Box 665, #11.

where the major parts of the modernization would be undertaken. Until Utah and the cruiser Raleigh were available for work, a "lean" time was anticipated, requiring the furloughing of some workers.[8]

Among the general matters discussed at the conference was the commandant's concern with the financial loss resulting from the burning of waste paper and oil. Both items had a sale value, and a system was being developed for their salvage. Management regarded as "a very bad condition" the fact that Boston paid more accident compensation money than any other yard. Disciplinary action was threatened against supervisors who allowed unsafe conditions and practices to persist in their shops.

The new commandant expressed concern with the general tone of personnel relations in the yard. He believed that

> there is not enough friendliness in the Yard. He likes to see officers, supervisors, enlisted men and workmen greet each other on meeting. It does no harm to say "Good morning," or "It's a nice day." Particularly, he wants men meeting him to exchange such greetings. There will be no order, or nothing official on this, but it is noted for your information.

Admiral Andrews closed the meeting by stressing "the necessity of eternal vigilance in the matter of economy in order to meet the competition of other Yards and retain our share of the work."

An appreciation of the activities of nonindustrial units, namely the office of the captain of the yard, the dispensary, and the Supply Department, is provided by an annual report submitted for the fiscal year 1926 to the Secretary of the Navy by

8. Memorandum of Matters Discussed at Masters' Conference, Nov. 11, 1925, 181-40, Box 2, A3-2.

Commandant Andrews, who had arrived in the yard in October 1925. Another change occurred in that month, when Capt. Roscoe G. Moody became captain of the yard, replacing Capt. Yancey S. Williams.[9]

By October 1928, the organization headed by the captain of the yard had become known as the "Military Department."[10] Whatever its name may have been, a number of circumstances placed increased demands on the captain of the yard and account for the remarkable growth of his office. The availability of automobiles to ordinary Americans, the annexation of the South Boston Dry Dock, the acquisition of a variety of yard craft, the exclusion from the Industrial Department of personnel not engaged in ship work or manufacturing, and other developments enlarged the function of the captain of the yard.

In the mid-1920s, the captain of the yard had five assistant officers, two clerks, a complement of thirty-one enlisted men, and a security force of eighteen civilians. His office had charge of fire protection and of the yard's fire-fighting apparatus. That apparatus included two hand-drawn hose reels and a chemical tank, manned by a detail of marines when the occasion arose. Seven hundred and thirty-two soda and acid and roughly 200 pyrene fire extinguishers were distributed in buildings and in ships out of commission. Two 5000-gallon foam tank extinguishers were located at the eastern end of the yard for use in the event of fire at the fuel oil and gasoline tanks. Ten yard

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9. Commandant to Secretary of Navy, Jul. 27, 1926, 181-40, Box 41, A-1.

10. See Organization Boston Navy Yard, Oct. 25, 1928, 181-40, Box 151 (1929), A3-1.

buildings had sprinkler systems, and all were equipped with standpipes and attached fire hoses and nozzles. Fire protection included a monthly extinguisher inspection by the captain of the yard, daily inspection of yard buildings, and frequent, but irregularly scheduled, fire drills. During fiscal year 1926, twelve fires occurred in the yard, the Boston Fire Department responding to four of them. Each of the fires caused only negligible damage.

Parking became a problem in the 1920s, as more and more yard personnel became owners of automobiles. All vehicles were required to be registered with the office of the captain of the yard, which issued stickers and assigned parking spaces. During the year ending in June 30, 1926, more than one thousand cars were registered. The captain of the yard also administered the gate-pass system, issuing six-month passes to the departments, which made them out for their officers and employees. Outsiders regularly coming into the yard for business were registered in the captain´s office and received three-month passes.

Constitution, berthed at the yard since 1897, attracted a large number of visitors, particularly during the spring and summer months. Some vistors arrived via one of the four bus lines, which had permission to enter the yard. During fiscal year 1926, 35,000 people entered their names in the signature book of "Old Ironsides," and at least 65,000 others came to see the historic warship. Public interest in the ship increased in the latter years of the decade, because of a campaign to finance her reconstruction by private contributions.

In the mid-1920s, the Boston Navy Yard´s police force

consisted of a police lieutenant, four sergeants, and seventeen policemen and shipkeepers. Shipkeepers, previously part of the Department of Construction and Repair, had charge of security of the vessels out of commission. In 1925 and 1926, there were five such ships, Chester, Arethusa, Neptune, Bridgeport, and Craneship No. 1, the former battleship Kearsage. Essentially, the security force sought to protect the yard, buildings, and ships from thieves, vandals, and fires. The force maintained watches in the yard during nonworking hours and days. Portable watch clocks and fifty-three watchmen's boxes were employed to insure the police force made its rounds.

One of the officers assigned to the captain of the yard had responsibility for the department's waterborne property. That included three tugs, twenty-one coal barges, two oil barges, four freight lighters, two ammunition lighters, one ash lighter, a garbage lighter, three floating derricks, and one floating crane. Enlisted men assigned to the captain of the yard composed the crews of the tugs and barges.

The captain of the yard continued to have oversight of the general cleanliness of the yard. At the Charlestown site, that function was delegated to the Yard Boatswain. Another assistant had charge of the South Boston Annex. The annex, the Squantum plant, Lockwood's Basin, and the Malden nitre depot required provisions for plant security and occasional inspections. In addition, an officer assisting the captain of the yard was required to be present during the docking and undocking of vessels at South Boston. Comparison of the responsibilities of the captain of the yard in the 1890s and the 1920s reveals the

growing complexity of the Boston Navy Yard.

In the decade after World War I, the yard's dispensary consisted of eight officers, a chief pharmacist, a female nurse, and two laborers. The Medical Department provided medical and dental services to all Navy and Marine personnel attached to the yard, their family members who came to the dispensary or who lived within one mile of the yard, crews of ships in the yard not having a medical officer, and yard employees in need of emergency care. Admiral Andrews, the new commandant, displayed an interest in the health of civilian workers. On his orders, almost seven hundred employees received preliminary eye examinations in 1926. An eye specialist from Chelsea hospital examined four hundred workers more thoroughly and issued 320 prescriptions for glasses.

Also, the commandant made arrangements with the Bureau of Medicine and Surgery for the loan of Navy equipment to outfit a "well appointed Dental Office for Yard employees" in Building No. 34. Workers could have their teeth checked, cleaned, and x-rayed. If required, a civilian dentist from Charlestown made a further examination. No government funds were available for the project, and workers paid $1.00 for the cleaning and the same amount for x-ray services. In the following year, the dispensary provided free physical examinations for yard employees. Such services were not policies of the Navy Department, but display the initiative and progressive attitudes of the Boston yard commandant in matters of personnel relations.

In addition to dispensing medical care, the Medical Department performed a variety of other functions. It furnished

medical supplies to ships making short cruises with reservists; compiled a monthly sanitary report for the commandant; inspected firms supplying foodstuffs to the yard; provided a medical officer as an assistant to the yard Safety Officer; conducted physical examinations for the Labor Board; maintained records required by the U.S. Employee Compensation Commission; and provided a hospital corpsman for the South Boston Annex.

Between July 1925 and June 1926, the Supply Department of the Boston Navy Yard rearranged its stores so that all items in any one class were stored on the same floor of the general storehouse, Building No. 149. That rearrangement was designed to facilitate the issuing and inventorying of stores. The department held two public auctions and thirteen sealed bid sales of condemned and surplus material, which netted $71,500. No vessels were commissioned or outfitted by the yard during fiscal year 1926, but the supply officer prepared invoices and assembled goods for the outfitting of the aircraft carrier Lexington, under construction at Fore River and scheduled for completion in the spring of 1927. Because of acquisition of material for the carrier, the value of stores on hand rose from $10,700,000 in July 1925 to $12,625,000 a year later.

During the year, the Supply Department received 47,156 tons of stores and issued 67,235 tons, not including fuel. Fuel receipts consisted of 27,000 tons of bituminous and 214 tons of anthracite coal, 170,944 barrels of fuel oil, and 104,769 gallons of gasoline. In the same period, the Navy collier Orion and a private vessel discharged more than 5000 tons of steamer coal at the yard coaling plant. Because of the "rather uncertain

condition as to the operating ability of the coaling plant," a contract was made with a commercial fuel company to deliver coal by rail direct to the yard's central power station.

The improperly working coaling plant testifies to one of the major problems that plagued the Boston Navy Yard and the Navy generally during the 1920s, the want of funds. The emphasis of the national government on economy limited the number of ships in the fleet, reduced the Navy's civilian work force, and prevented improvements in and even proper maintenance of the physical plant of shore establishments.

FISCAL AUSTERITY AND THE YARD'S PLANT

In the mid-1920s, the office of the Plant Division consisted of four officers, nine clerks, two draftsmen, six technicians, and seven telephone operators. The division had three shops: Transportation (02), with five supervisory mechanics and forty-seven workmen; Building Trades (70), nine master workmen, quartermen, and leadingmen and sixty-three workers; and Central Power Plant (03), two supervisors and sixty-five workmen.[11] The Plant Engineer, head of the division, also had responsibility for insuring private contractors complied with the terms of their agreements with the Navy. In fiscal year 1926, work under contract for the Boston Navy Yard consisted of repairs to a dry dock crane, removal of a bridge at the Squantum plant, dredging, and rebuilding Piers Nos. 6 and 7. In addition, the Plant Division monitored work under contract at South Boston and other

11. U.S. Navy Yard, Boston, Organization, Nov. 1, 1925, 181-40, Box 3, A3-1.

Navy installations in the area. In 1925 and 1926, the division's draftsmen and technicians prepared plans and specifications for new contracts, including for a utility building at South Boston, keel blocks for Dry Dock Nos. 1 and 2, and repairs to Piers Nos. 2, 4, and 7 at the yard and to a wharf at Hingham.

Maintenance of the yard's buildings, facilities, and grounds encountered difficulty in the 1920s because of shortages of funds for labor and material. Nevertheless, the Building Trades Shop had a busy schedule. For example, in the twelve months following July 1, 1925, its work included rearranging and installing new lights in Building No. 42; paving at the intersection of First Avenue and Ninth Street and at Dry Dock No. 2; removal of railroad tracks at Squantum; repairing a retaining wall near Pier No. 5; repairs to the coal pocket; repointing masonry in Dry Dock No. 1; and laying a new floor in the ropewalk. In that year, the Transportation Shop performed additional work in connection with the cranes and locomotives engaged in the modernization of the battleship Florida.[12]

The physical plant of the main site of the Boston Navy Yard changed little during the 1920s. In 1921, the Bureau of Yards and Docks announced completion of the program launched five years earlier to improve and equip navy yards for the repair and construction of capital ships. No new programs were instituted or sought, and Congress, in the interests of economy, generally provided only small sums for public works at shore establishments. No new buildings were erected at the Boston yard, except

12. Commandant to Secretary of Navy, Jul. 27, 1926, 181-40, Box 41, A-1.

for a pump house, Building No. 191, built in connection with installation of a circulating loop to provide water for cooling purposes to the central power plant. Funds were approved for improving existing buildings and facilities, particularly the power plant and the wharves. However, following completion of the marine railway and the reconstruction of Building No. 42, there was no expansion of ship work facilities at the yard in Charlestown and little at the South Boston annex. During the 1920s, some important new machinery was installed in several shops, but essentially the period saw retention of the status quo respecting the yard's physical facilities.

The roof over the older section of the foundry, Building No. 42-C, required replacement, since it was old, "punky" and frequently caught fire. One conflagration occurred during the pouring of a cylinder for Pecos, the fuel ship being constructed at the yard. A steel and concrete roof was provided in 1924 and 1925. The central power plant, Building No. 108, benefitted more than any other structure from congressional appropriations. The plant received new equipment to increase its capacity for production of steam, electricity, heat, and compressed air. Several extensions to the structure provided space for additional equipment. A third building improved during the decade was the shipsmiths' shop, which was reroofed.[13]

During the 1920s, some of the yard's piers were repaired and

13. Commandant to Bureau of Engineering, Jul. 11, 1921, 181-40, Box 752, #113; Chap. 203, May 28, 1924, SAL, vol. XLIII, p. 197; ARND, 1925, (FSS #8600), p. 128; ARND, 1922, (FSS #8179), p. 801; Chap. 209, Feb. 11, 1925, SAL, vol. XLVII, p. 876; Chap. 656, May 21, 1928, SAL, vol. XLV, p. 635; Chap. 483, Mar. 2, 1929, SAL, vol. XLV, p. 1463.

rebuilt, but others were neglected, adding to the deterioration suffered during the war. In February 1929, Piers Nos. 2, 6, and 7 were reported in good condition; Pier No. 4 was then being rebuilt; and Pier No. 3 was scheduled for reconstruction. The work on piers did not extend them to the new pierhead line. Since 1923, unsuccessful efforts had been made to obtain funds for repairing Wharf No. 1. Use of the outer 200 feet of that structure was banned, and the entire pier needed rebuilding. Piers Nos. 4-A, 8, 9, and 10 were in almost as bad condition, restrictions having been imposed on their use by cranes, locomotives, and trucks.[14]

A small addition to the yard's ship repair facilities was the acquisition of a crane to operate on Pier No. 2, for service in work on ships hauled out by the marine railway. Dry Dock No. 2 received a new sewage disposal system for ships in the dock, but no other changes occurred in either of the two dry docks.[15]

Budget limitations forced the yard administrators to determine the most necessary and vital plant repairs. The central power plant, half of the piers, and the foundry roof were priority items. On the other hand, some structures in need of repair did not appear crucial. This was the case with the coaling plant, Building No. 109, in dubious working order throughout the decade. Since more and more naval vessels burned fuel oil, the

14. Plant Engineer to Commandant, Feb. 2, 1929, 181-40, Box 155, A9-1.

15. Report of Activities, First Naval District, Jul. 1, 1926-Jun. 30, 1927, 181-40, Box 83, A9-1; P.L. 612, Feb. 6, 1931, SAL, vol. XLVI, p. 1072.

coaling plant functioned primarily to provide coal for industrial use in the yard. Thus its operations were not deemed essential, especially since coal could be delivered to the power plant by rail.[16]

The acquisition of the South Boston Annex provided the Navy with the largest dry dock in the world, but little else beyond a pump house and two approach piers. The initial plan was to utilize the dock only for vessels too large for Dry Dock No. 2 at Charlestown. As much work as possible respecting those ships was to be performed at the main yard, and structural and other parts, tools, and workmen would be transported to the annex by tug and lighter as required. However, even limited use of Dry Dock No. 3 necessitated some plant at the annex in addition to the dock itself. In 1921, prior to the Denby reorganization, the head of the Machinery Division indicated that at times 125 of his machinists worked at Dry Dock No. 3. Facilities were needed by them, Hull Division workers, Marine Corps guards, and the crews of vessels in the dock. A completely equipped dry dock had the capacity to provide ships with electricity, steam, compressed air, water, storage space, sewage removal, and other services. Such services were missing in the early 1920s at the annex. Moreover, it made little sense and increased costs to ferry all tools back and forth between the two sites, but to keep tools at South Boston required a shelter. During the decade, the annex

16. Development of Navy Yard Plans, First Naval District, attached to Commandant to Capt. John L. Hyland, Feb. 2, 1929, 181-40, Box 140, A1-1.

began to acquire some facilities.[17]

Several of the small, temporary structures erected at the main yard for storage purposes during the war were transferred to South Boston. Also, the pump house at the annex was enlarged to provide space for equipment. In 1927, a general utility building was erected. That structure, the so-called "Providence Building," had been part of a World War I Navy-owned boiler shop in Providence, Rhode Island. Upon dismantling the plant, the building had been taken down and stored at South Boston. In 1927, funds existed for erecting only a 150-foot section, but that was sufficient for lockers, washroom, mess hall, storage, and other purposes. The dock itself was improved with installation of high speed electric capstans; heavier bollards; sewage removal system; lines for electricity, air, and water; additional keel blocks; and lighting for night work.[18]

A beginning was made in the development of the South Boston Annex, but by 1929 much remained to be accomplished. Neither pier was adequate for berthing a battleship; the dock lacked a salt-water flushing system; and additional space was required for storage and shops. In a sense, the Navy obtained Dry Dock No. 3 in response to the pressure of World War I, and it would take another war to secure the development of the annex. Similarly, the threat of war and the need for stimulation of the depressed economy of the 1930s were required before Congress appropriated

17. Commandant to Chief, Bureau of Engineering, Jul. 7, 1921, 181-40, Box 752, #13.

18. Development of Navy Yard Plans, First Naval District, 1926-1927; Activities of the Bureau of Yards and Docks, World War, p. 218; Memorandum for Commandant, n.d. [1925].

sufficient funds for proper plant maintenance at the main yard.

THE REDUCTION IN CIVILIAN EMPLOYEES

The 1920s saw a contraction in the number of civilian employees at the Boston Navy Yard. On several occasions, workers temporarily increased in number, but the general trend was a reduction in the labor force. On January 1, 1921, 5865 workers manned the shops and offices of the yard. Ten years later, there were 1697. The shrinking labor rolls resulted from several circumstances. Activities connected with World War I lingered into the early 1920s, and their termination and the yard's final return to a peacetime footing was accompanied by laying off workers. The contraction of the fleet and the Republican administration's commitment to economy resulted in further cuts. The Navy placed greater reliance on maintenance and repair of ships by their crews or by repair vessels and reduced the interval between and the duration of regular overhauls. The calamity which struck the general economy beginning in 1929 brought calls for further retrenchment in government expenditures. All of these developments produced a smaller group of employees at the Boston Navy Yard.

In the mid-1920s, the yard modernized two battleships, projects which, while they lasted, halted the downward employment trend. The labor force also expanded and contracted with the arrival and departure of Leviathan, the huge passenger liner, for its semi-annual docking, and with the movements of the Navy's fleet organization assigned to the Atlantic. But these changes occurred within the general pattern of a shrinking number of

civilian workers.

The reduction in workers was accomplished primarily through outright discharge from yard employment. A retirement act, passed by Congress in 1920, provided pension payments to elderly employees with fifteen or more years of service. The same act made retirement mandatory for all mechanics attaining the age of sixty-five. During the year ending June 30, 1921, forty-two employees of the Machinery Division were forced to retire. In the same period, the division discharged 400 mechanics. Other sizeable reductions occurred during the decade. In November 1928, Manager Simmers anticipated laying off 700 men early in the following year, if the yard did not obtain additional work. Simmers' calculation proved accurate, and the manual labor force declined from 2278 in January 1929 to 1580 in April.[19]

By the middle of the decade, discharges had removed most of the workers first employed in the period 1917-1919. Thereafter, reductions eliminated men with lengthy careers at the yard. Efforts were made to protect some of these employees by extending the furlough period. Men on furlough were placed on the Labor Board's preferred list and were to be rehired before those on the general list. A discharge meant having to reregister and being lumped together with entirely new applicants. Before the war, Civil Service regulations had limited the furlough period to no more than ten days. In the 1920s, furloughs were lengthened to thirty and then sixty days. In March 1928, the Industrial

19. Commandant to Chief, Bureau of Engineering, Jul. 11, 1921, 181-40, Box 752, #13; Simmers to William Perrott, Nov. 22, 1928, 181-40, Box 148, OO/Simmers; Employees on Rolls of Boston Navy Yard, Jan. 1927-Mar. 1930, n.d., 181-40, Box 203 (1930), L16-4.

Department had two hundred men on sixty-day furloughs, "many of them our best material." In anticipation of the large layoff of early 1929, administrators notified commandants of other East Coast navy yards in an effort to secure the transfer of Boston workers. The Boston yard also issued a press release to eight local newspapers, describing the situation and advising private industries to contact the yard to obtain the services of qualified machinists, electricians, pipefitters, plumbers, and sheet metal and iron workers.[20]

Theoretically, an "efficiency marking system" determined which workers would be discharged as a result of lack of funds or of work. That system was placed in operation in September 1921, and its introduction required the marking or grading of the entire work force. As in the past, marks were assigned in the area of workmanship and conduct. All individuals already employed at the yard and new workers hired thereafter received a conduct grade of 100 percent. Leadingmen and quartermen assigned grades for workmanship based on performance. Subsequently, points were added or deducted. When a reduction in force became necessary, workers with the lowest efficiency ratings were to be discharged. The marking system also determined the assignment of a worker to one of the three wage classifications in his trade. Those with ratings of eighty or better received the highest wages; those between sixty and seventy-nine were in the intermediate group; and those below sixty in the lowest classsification. At the end of the first six months of the new

20. Simmers to Capt. Marquart, Mar. 2, 1928, 181-40, Box 148; Simmers, News Item, Dec. 24, 1928, 181-40, Box 155 (1929), A7-1.

system, all below sixty were to be discharged, The ultimate objective of the system was to produce a work force consisting entirely of workers with efficiency ratings of eighty or better.[21]

In actual practice, workers in the lowest classification were retained. One incident suggests that that policy may have resulted from budgetary considerations. In October 1924, a number of second-class shipfitters were laid off, despite the fact that the yard continued to employ shipfitters of the third class. At the time, there was some "low grade" shipfitters' work, suitable for mechanics of either the second or third classes. Yard administrators decided to retain the third-class shipfitters and lay off the second-class mechanics, since this would involve a savings of forty cents per day per man.[22]

With workers being discharged in large numbers, maintenance of lengthy registers by the Labor Board served little purpose. At times, the board suspended acceptance of applications for many trades because of the numerous eligibles already on the lists and the poor prospects for employment.[23]

Some workers who lost their jobs at the Boston Navy Yard sought the intervention of congressmen, veterans groups, or unions. Inquiries and protests from such parties on behalf of constituents or members accomplished little, except to consume

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21. Commandant's Order No. 70, Oct. 24, 1921, 181-40, Box 405 (1936), A2-5; Employments, n.d., 181-39, Box 759 (1921), #154.

22. Commandant to Assistant Secretary of Navy, May 8, 1925, 181-40, Box 26, LA.

23. Report of Activities, First Naval District, Jul. 1, 1926-Jun. 30, 1927, 181-40, Box 83, A9-1.

the time of yard officers. In 1928, Captain Simmers complained of having to answer so many letters from "congressmen, senators, governors, councilmen, etc.," and Commandant Andrews hoped the Navy Department would issue a circular letter, which "would do much toward curtailing a lot of the claims of discrimination against those who are responsible for administration of our navy yards."[24]

Because of their concern with the costs of operations, yard officers sometimes dealt harshly with employees loafing on the job. On November 21, 1925, Ernest N. Martin, chipper and calker, left his work station in the inner bottom of Florida. He later claimed that the fumes from the red lead and from a welding machine forced him out of the ship to the carpenters' shop, where he sat down for a few minutes to recover. The assistant outside superintendent reported Martin for being absent from his work and for loafing. The production superintendent recommended a two-day suspension, but Commandant Andrews ordered the workman discharged.[25]

In another incident, two first-class machinists, one with eleven years of service in the yard, were working on Wainwright, hauled out on the marine railway. They stopped work a few minutes before the final whistle and were proceeding across the caisson of Dry Dock No. 2 to turn in their tools at the machine

24. Commandant to Congressman Thayer, Aug. 13, 1925; Commandant to Congressman Douglass, Nov. 17, 1925; Commandant to American Legion, Mar. 12, 1925, all in 181-40, Box 26, LA; Simmers to Capt. Wilkins, Mar. 20, 1928, 181-40, Box 148, OO/Simmers.

25. Production Superintendent to Commandant, Dec. 12, 1925, 181-40, LA-Martin.

shop. While crossing the caisson, they encountered the commandant, who questioned them just as the whistle sounded. Perhaps because of their lengthy service, the machinists received only a reprimand, a punishment that did not match Admiral Andrews' annoyance, if not anger. The commandant acknowledged that the amount of time "which they were dawdling around...was not great," but he contended that such actions by "first class machinists of their length of service" were "helping to keep work away from the Navy Yard instead of getting it as we all want."[26]

Throughout the 1920s, the Boston Navy Yard usually followed a schedule of eight hours a day for manual workers and seven for the office staff. Except during the summer, when the yard closed on Saturday afternoons, the work week was six days. However, in 1921 and 1922, at the same time the Navy reduced the number of its workers, high unemployment prevailed in many parts of the nation. To retain as many workers as possible on navy yard rolls, the Navy Department instituted a five-day week, beginning in July 1921. That schedule prevailed until December 1922, when the yards returned to a six-day week. At the other end of the decade, the massive unemployment of the Great Depression also resulted in manipulation of the hours of government employees.[27]

In 1920, Congress enacted a retirement program for employees in the classified civil service of the United States, including navy yards. Workers who had at least fifteen years of service

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26. Memorandum for Capt. Simmers, Mar. 30, 1928, 181-40, Box 141, LA.

27. ARND, 1922 (FSS #8179), p. 24; ARND, 1923 (FSS #8291), p. 36.

and who had attained the age of seventy years, sixty-five in the case of mechanics, were entitled to an annuity ranging from $180 to $720, depending on their length of service and the wages or salary received during the last ten years. To provide the funds, the government deducted two and a half percent from the pay of workers covered by the system. An amendment in 1926 increased the maximum retirement payments to $1000 a year and raised the employees' deduction to three and a half percent. With certain exceptions, retirement was mandatory for employees reaching the age of sixty-five or seventy. The retirement program thus was of some assistance in the reduction of navy yard labor forces in the Twenties.[28]

During World War I, the Navy abandoned the procedure whereby a local wage board annually recommended a schedule of wages for a navy yard, based on the prevailing rates of pay in private firms in the vicinity. Revived in 1921, that system was employed until the end of the decade. In November 1929, the Secretary of the Navy dissolved the existing apparatus, set aside wage recommendations for 1930, and continued the 1929 schedules. Similar orders each year thereafter perpetuated the 1929 rates until 1940. That policy, of course, was related to the collapse of the American economy in 1929 and the continuation of the Great Depression throughout the 1930s.[29] Actual wage rates fluctuated wildly in the early 1920s, stabilized in 1925, and rose slightly until 1929. Thereafter, they remained constant for more than a

28. P.L. 195, May 22, 1920, SAL, vol. XLI, pp. 614-20; P.L. 522, Jul. 3, 1926, SAL, vol. XLIV, pp. 904-13.

29. McPherson and Watts, p. 4.

decade.

Besides a board in each navy yard consisting of three officers and a civilian recorder, the wage-fixing apparatus of the 1920s included a Wage Review Board in Washington. Established by the Secretary of the Navy, that board was composed of a naval officer, a civilian official, and a representative of labor. The board reviewed proposed schedules from the yard wage boards and made recommendations to the Secretary of the Navy, who had final authority. At the other end of the system, shop committees of yard workers became formally institutionalized and participated in the preparation of proposed schedules.

Such committees had existed in the Boston Navy Yard for many years. However, they achieved official status in October 1921 on orders of Commandant Albert Gleaves. According to the commandant's understanding, the purpose of the shop committees was "to bring about more intimate relations and closer cooperation between Management and the workmen of the Yard." Thus, the committees could deal with matters other than wages. Gleaves gave orders for the assembling of all shop committeemen on the first Wednesday of each month, at which time they would meet with the commandant, manager, captain of the yard, and ten other officers. Special meetings of all shop committeemen or of certain shop committees could be held as found necessary. In actual practice, the committees functioned primarily in the determination of wages. They came into formal existence in 1921, when the wage board system reappeared, and annual elections of committeemen were generally held shortly before the wage board began its deliberations. After the wage board apparatus was suspended

in 1930, the committee system went into abeyance. Gleaves noted that "shop committees are not intended to be representative of any trade or faction or Union, but are to be representative of the shop or unit as a whole." He also stated that the existence of committees did not "interfere" with the right of any worker to communicate individually with yard administrators.[30]

In the 1920s, employee organizations other than shop committees sought to be recognized by the yard administration. Gleaves approved a request from a unit of United Veterans of the Republic to function as a "grievance committee." That particular unit, composed entirely of yard workers, had existed for many years. The admimistration did not grant official status to an outright union. Early in 1928, the president of the local of the National Federation of Federal Employees requested permission to use yard bulletin boards for posting the organization's notices. The local was then, in fact, engaged in a recruitment drive. Admiral Andrews denied the request for use of bulletin boards, since approval "would violate the Navy rules and regulations relative to such matters."[31]

Shop committees functioned at three stages in the preparation of proposed wage schedules. They met with the Wage Board to decide from which private establishments information about wages should be obtained. Because of the great number of industrial firms in the Boston area, it became impossible to

30. Order No. 68, Oct. 20, 1921, 181-40, Box 759, #15.

31. Unit No. 12, United Veterans of the Republic, to Adm. Albert Gleaves, Nov. 7, 1921, 181-39, Box 759, #15; Commandant to John Giantonio, Feb. 1, 1928, 181-40, Box 118, A7-1.

collect data from all of them. Emphasis was placed on identifying "representative private establishments." The Wage Board initiated the process by submitting a tentative list of such firms to a meeting of shop committeemen, who were invited to prepare their own lists. Hearings were held, during which committeemen had an opportunity to argue for or against the inclusion of a particular establishment. Out of this process emerged a formal list of firms. Workers had the right to appeal to the Secretary of the Navy concerning the board's decision respecting any particular company.[32]

Shop committeemen were also involved in the next stage of the wage schedule procedure, the collection of data. Navy regulations stipulated that a wage board should not limit itself merely to sending out forms to commercial establishments, but "should take upon itself the duty of visiting as many of them as possible...." No longer was confidentiality a part of the system, and, in fact, regulations stated that "confidential data shall not be obtained or considered." This allowed workers, the committeemen, to participate in the process. At the Boston Navy Yard, small teams composed of an officer and the committees of interested shops made visitations to companies in the area to confirm the data obtained through the mails.[33]

Utilizing a Navy Department mathematical process, the Wage Board determined the weighted average pay per hour for maximum.

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32. Regulations for Boards on Wages, Jul. 27, 1926, 181-40, Box 53, L16-1.

33. Simmers to Wellbrook, Oct. 22, 1925, 181-40, Box 32, OO/Simmers.

intermediate, and minimum rates for each trade and occupation covered in the wage schedule. The results constituted the proposed schedule for the next calendar year. The board then held hearings, so that shop committees could make presentations respecting the proposed rates for the trades they represented. Such hearings were scheduled early enough to allow for further investigations, should a shop committee's determination of prevailng rates differ from that of the board. Brief summaries of those hearings were included in the board's final report, when it was impossible for a shop committee and the board to reconcile their differences. The board's report consisted of the proposed schedule, recommendations, summaries of hearings, and the data collected from private firms. That report went to the commandant, who added his own observations and suggestions, before forwarding the whole package to the Secretary of the Navy.

The Secretary submitted all proposed schedules and other material to the Wage Review Board. That board held hearings in Washington open to representatives of labor. Following those hearings and its consideration of all information, the Wage Review Board made its recommendations to the Secretary.

Yard officers doubtless became experienced in wage board operations and developed techniques to expedite proceedings, but on its face the system appears cumbersome. At one time in the 1920s, the Boston Navy Yard had forty-eight shop committees, all entitled to be heard at several stages in the process. The list of representative firms used to prepare the 1928 schedule consists of 591 companies. And the yard employed workmen in 116

different trades and occupations, for each of which data had to be collected and a proposed wage recommended.[34]

The Navy's wage-fixing process in the 1920s combined statistical precision, such as weighted averages, and subjective judgments, such as "representative firms" and "public interest." The Navy, beginning in 1923, provided an interpretation of the language of the original congressional statute of 1862, establishing the navy yard wage system. That enactment required yard wages to conform "as nearly as is consistent with the public interest with those of private establishments in the immediate vicinity." The department in the 1920s held that "the public interest" meant "the interests of the public of which the employees of the Naval establishment constitute a part, and does not exclude the taxpayers of the country, who must furnish the funds from which wages are to be paid."[35] The department did not explain how members of the Wage Board were to integrate concern for taxpayers into the wage-fixing mechanism. However, that concern would obviously impose limits on wage increases, regardless of prevailing rates in private establishments.

It also became clear that the system favored certain trades. According to the Boston Navy Yard manager, Captain Simmers, highly organized workmen fared better than others. The International Association of Machinists, for example, maintained an

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34. Index of Names of Private Establishments, Sep. 1928, 181-40, Box 79, A2-2; Schedule of Wages, 1923, 181-40, Box 127 (1928), L16-1; Commandant's Order No. 146, Aug 3, 1928, 181-40, Box 127, L16-1.

35. Quoted in McPherson and Watts, p. 3.

office in Washington, with a veteran president and business representative, whose experience dated at least as far back as the successful 1913 protest against Taylorism. Workers in or allied with the building trades also enjoyed organizational support. On the other hand, ordnancemen and ropewalkers lacked the capacity to exert pressure on their own behalf, and their wages were relatively low. Commandant Andrews feared that the wage levels of several basic shipyard trades were so low as to discourage men from entering them.[36] The point is that the elaborate, time-consuming method for fixing navy yard wages involved the collection of precise data, but also allowed room for the play of subjective judgments and political clout. Although perhaps workable in normal conditions, the system was ill-suited for times of international crisis, such as world wars, or national economic disarray, such as the Great Depression.

Wages paid navy yard workers had increased dramatically after the United States entered World War I and then had declined. However, wages never returned to prewar levels and, beginning in 1924, slowly rose until 1929. The economic policies of the Harding administration became evident in 1921, when the revived wage board system produced its first set of proposed schedules. The Secretary of the Navy accepted the recommendations of the Wage Review Board for across-the-board reductions. The schedule, approved by the Secretary, governed wages from

36. International Association of Machinists to Assistant Secretary of Navy, Nov. 12, 1921, 181-39, Box 759, #15; Simmers to Wellbrook, Oct 22, 1925, 181-40, Box 32, OO/Simmers; Commandant to Assistant Secretary of Navy, Jan. 6, 1928, 181-40, Box 127, L16-1.

September 16, 1921, to April 20, 1923. The situation then became highly fluid, if not chaotic, and during the remainder of 1923, three new schedules were instituted in rapid sequence. The last of the three remained in force until December 31. Annual schedules then became the rule. Between 1921 and May 1923, wages declined for about sixty percent of the ratings at the Boston Navy Yard, rose for thirty-six percent, and remained constant for the balance. Wages for ropemakers' helpers decreased from $4.36 to $2.50 per day, a walloping forty percent reduction; from $11.84 to $8.32 for heavy forgers, a thirty percent decline; and for other trades suffering cuts, approximately fifteen percent. Those workers enjoying increases between 1921 and 1923 were in the building trades, such as masons, plumbers, and plasterers. During the war, there had been a relative shortage of mechanics with ship repair skills. By 1923, a nationwide construction boom started, producing high wages for workers allied with the building trades.

Beginning in 1924, the pay rates for most categories of workers at the Boston Navy Yard increased. Machinists, for example, received $5.68 a day in 1923, $6.66 in 1925, $6.72 in 1928, and $7.04 in 1929. In all ratings, the schedule for 1929 provided higher wages than paid at any time during the World War I era.[37]

As to be expected, the wage schedules encountered criticism, and, despite the general increase in wages at the Boston yard,

37. This analysis is based on Schedule of Wages, 1923, 181-40, Box 127 (1928), L16-1; Table of Organization, Nov. 1, 1925, 181-40, Box 2, A3-1; Table of Organization, Mar. 1, 1928, 181-40, Box 116, A3-1.

some workers were dissatisfied. In 1927, for example, shipwrights, drillers, and shipfitters protested the wages assigned to them.[38]

On the other hand, private shipbuilding and repair establishments complained of excessive wages at government yards. In 1928, the Navy Department received complaints from such firms "on the East and West Coasts and on the Great Lakes." The major private ship work company in the Boston area was Bethlehem Shipbuilding Corporation, which owned the Fore River plant. In December 1928, that plant's personnel manager conferred with Commandant Andrews, who explained the wage-fixing process. As was true for other large commercial shipbuilding firms across the country, the Bethlehem company had not fully cooperated with the wage board of the local navy yard in the annual collection of data. That operated to the company's disadvantage, since its wages were lower than those paid in the yard. Inclusion of Fore River rates in computation of the weighted averages would have reduced wage rates in the Boston Navy Yard.[39]

After the conference, Admiral Andrews assembled a chart comparing the hourly wages paid certain trades at Fore River and at the yard. He also included the average wages in a schedule used by the Boston-based National Metal Trades Association as of

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38. Shipfitters' Committee to Departmental Wage Board, Sep. 17, 1927; Drillers' Committee to Wage Board, Sep. 16, 1927; Shipwrights' Committee to Departmental Wage Board, Sep. 15, 1927, all in 181-40, Box 79, A2-2.

39. Simmers to Capt. Williams, Dec. 15, 1928, 181-40, Box 148, OO/Simmers; Williams to Simmers, Dec. 18, 1928; Commandant to Assistant Secretary of Navy, Dec. 21, 1928, both in 181-40, Box 127, L16-1.

October 1, 1927. That chart is as follows:

Table No. 9: COMPARATIVE HOURLY WAGES, BOSTON NAVY YARD, NATIONAL METAL TRADES ASSOCIATION, BETHLEHEM SHIPBUILDING CORPORATION (FORE RIVER), 1927, 1928

Trade	Max. Navy Yard Pay	Ave. Natl. Metal Trades Assn Pay	Max. Fore River Pay
Boilermaker	.86	.77	.70
Machinist	.86	.77	.70
Toolmaker	.91	.77	.76
Diesinker	.96	.83	.76
Pipefitter	.94	.77	.70
Sheet metal worker	.94	.81	.70
Coppersmith	.92	.85	.76
Patternmaker	.97	.86	.78
Molders	.94	.90	.79

(SOURCE: Commandant to Assistant Secretary of Navy, Dec 12, 1928, 181-40, Box 127, 16-1)

For the trades included, it seems quite clear that in 1928, Boston Navy Yard wages substantially surpassed those of the Fore River plant of Bethlehem Steel and also those paid by members of the National Metal Trades Association.[40] In the decade which followed, the differentiation increased, as private employers cut wages in response to the depression and navy yards essentially retained the 1928 rates.

THE YARD'S INDUSTRIAL ACTIVITY IN THE ERA OF NAVAL DISARMAMENT

During the 1920s, the Boston Navy Yard's industrial function consisted primarily of the repair, overhaul, and maintenance of a diversity of vessels. After the completion of the destroyer tender Whitney in 1924, the yard engaged in no new construction during the next nine years, with the exception of two tugs. In the middle of the twenties, Congress authorized the building of

40. Commandant to Assistant Secretary of Navy, Dec, 21, 1928.

eight light cruisers, but Boston failed to win a contract for construction of any of the new warships.[41] Except for the cruisers and two aircraft carriers, the Navy acquired no additional vessels. Thus the yard did little in the way of commissioning, outfitting, or other work incident to the addition to the fleet of newly constructed ships.

The naval limitation treaty, the general contraction of the active fleet, the emphasis on budgetary restraints, and shorter and less frequent overhauls all reduced the number of vessels arriving at the yard for repairs. In addition, strategic considerations led to a reduction of ships geographically accessible to the Boston yard. In the summer of 1919, a decision was implemented to seek deterrence of Japanese expansion by shifting half of the Atlantic Fleet to constitute a newly established Pacific Fleet. Thereafter, more and more vessels were transferred to the West Coast, including all of the Navy's modern warships. By 1932, only the battleships Arkansas and Wyoming and eight World War I destroyers, known as the Training Squadron, were deployed in the Atlantic.[42]

Prior to the World War I, Boston had served as home yard for a division of five battleships. In the 1920s, no more than two battleships were among the yard's regulars. Each year in the second half of the decade, five or six cruisers received repairs at Boston. In the 1920s, the Navy's destroyer force greatly

41. Simmers to Capt. Williams, Mar. 20, 1928, 181-40, Box 148, OO/Simmers.)

42. Patrick Abbazi, Mr. Roosevelt's Navy: The Private War of the U.S. Atlantic Fleet, 1939-1942 (Annapolis: Naval Institute Press, 1975), pp. 23-4.

Table No. 10: DRY-DOCKINGS, BOSTON NAVY YARD, 1921-1934,
BY SHIP AND VESSEL TYPES

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
Battleships	8	3	5	2	4	3	2	6	1	0	1	0	0	0
Cruisers	2	2	6	9	7	6	6	5	4	8	15	6	2	0
Destroyers	44	36	5	13	11	8	16	11	11	7	14	3	8	3
Submarines	12	8	3	1	7	2	4	1	1	8	0	0	0	0
Small Warships	2	2	3	6	3	2	4	2	2	1	2	0	2	0
Minesweepers	1	0	3	0	2	5	3	5	0	4	0	0	0	0
Tenders	1	3	1	2	3	2	2	1	0	1	1	0	0	0
Colliers & Tankers	4	1	2	3	1	1	1	1	1	3	1	3	0	0
Other Navy	0	1	0	2	0	0	0	2	2	8	4	7	4	0
Tugs	4	4	7	7	5	8	4	5	2	1	4	4	8	4
Barges, Lighters	10	18	14	5	9	13	12	2	17	10	10	7	3	2
Misc Yd Craft	3	2	1	6	3	1	3	0	5	0	2	4	2	2
Treasury Vessels	1	2	3	1	2	7	20	13	22	44	38	38	27	9
Army Vessels	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Commerical Ships	3	2	4	6	4	2	4	5	5	1	3	3	0	1
Other & Unknown	1	2	2	3	1	2	2	3	6	3	1	0	0	0
Dry Dock No. 1	27	15	11	16	11	7	5	0	0	12	23	4	3	1
Dry Dock No. 2	22	40	18	12	16	9	21	10	19	20	19	18	7	0
Dry Dock No. 3	5	1	3	7	5	7	6	20	9	2	10	3	0	0
Marine Railway	43	32	27	31	30	39	51	32	51	65	44	50	46	20
TOTALS	97	88	59	66	62	62	83	62	79	99	96	75	56	21

(SOURCE: Docking Log, 181-60, and Yard Log, 181-58. The data in these documents for 1929 covers only the period to September 25.)

contracted, and by 1923, more than two hundred World War I flushdeckers had been placed out of commission, either at Philadelphia or San Diego. Seven to twelve destroyers annually came to Boston for repairs. The Navy decided that economy was best served by assigning all submarine work on the East Coast to the Portsmouth Navy Yard. Consequently, only rarely did submarines arrive at the Boston facility. Approximately one-third of the Navy vessels repaired at the yard were auxiliaries.

The volume of repair work required of the Boston yard on ships of the Navy during the years 1922 to 1932 measured less than that of any previous period in the twentieth century. Fewer than thirty ships on active duty annually came to the yard for repairs at the end of the decade. The work force was reduced, and the situation would have become even more critical had it not been for services rendered to other parties. Navy Department policy encouraged the yards to bid for contracts for the repair of vessels of several government agencies. The Boston yard's best customer, next to the Navy itself, was the Coast Guard. The yard also did work for the United States Shipping Board, the United States Lines, and the Lighthouse Service.

In the second half of the 1920s, the Navy divided its warships into two major organizations, the Battle Fleet, stationed in the Pacific, and the Scouting Fleet, in the Atlantic. Most of the twenty-three vessels for which Boston served as home yard belonged to the Scouting Fleet. They included Florida and Utah, units of Battleship Division Two; four members of the light cruiser division; and all six ships in Division Forty-One, Destroyer Squadron. In addition, Boston was home yard for the

destroyer Putnam, of Division Twenty-Six. The rest of the Boston-based ships were attached to smaller components of the Navy's fleet organization. Six minesweepers constituted Squadron One of the Control Force; two light cruisers and a gunboat were assigned to the Special Service Squadron; and the fuel ship Brazos, a unit in Train Squadron One, operated with the Scouting Fleet and Control Force.[43]

The Five Power Naval Treaty of 1922 directly and indirectly had an impact on the Boston Navy Yard. In the agreement, the United States, Great Britain, Japan, Italy, and France accepted limits on the number and tonnage of their capital ships and also agreed to a ten-year moratorium on capital ship construction. In accordance with the agreement, twenty-one American battleships and battle cruisers, some of them under construction, were scrapped. Those provisions resulted in less work for all navy yards. The treaty also included a replacement schedule, whereby some capital ships under construction were to be completed and others in commission were to be eliminated. In order for the United States to complete Colorado, it had to scrap Delaware. Delaware steamed into the Boston Navy Yard in September 1923, was stripped of all warlike equipment, and was decommissioned. It remained in the yard until February 1924, when it was sold and scrapped in accordance with the provisions of the treaty.[44]

Among the capital ships the United States retained under the

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43. Ships Having Boston as their Home Port, Feb. 25, 1929, 181-40, Box 151, A4-3; Chief of Naval Operations to All Bureaus, May 13, 1929, 181-40, Box 151, A3-1.

44. DANFS, vol. II, pp. 255-6; ARND, 1923 p. 23.

Washington Treaty were six battleships of the Utah, Arkansas, and Texas classes. All burned coal and needed extensive improvements to be of value to the fleet. Such improvements were permissible under the treaty, and in 1924 Congress provided the funds for the modernization of the six ships. The Boston Navy Yard undertook that work for Florida and Utah the oldest of the six. Neither vessel was a stranger to the yard, which had regunned Florida in 1923. In the following year, she was placed in reserve commission, and in April 1925, the modernization project began.

That project included conversion to oil-fired propulsion and modifications of the vessel's defenses against submarines and aircraft. Curtis geared turbines replaced the original Parsons turbines, and four White Foster boilers were substituted for the former twelve Babcock and Wilcox. The yard converted coal bunkers into oil storage spaces and trucked the uptakes of the four new boilers into a single stack, removing the original two stacks. Florida's profile also changed because of the substitution of a small pole for the cage mainmast. The modernization involved increasing underwater protection, chiefly through the addition of anti-torpedo blisters. Blister protection consisted of providing the ship with a thin outside shell, capable of exploding a mine or torpedo on contact and thus greatly minimizing the damage inflicted on the hull proper. The blisters enlarged the ship's beam from eighty-eight to 106 feet. As countermeasures against air attacks, additional armor was provided for turrets and decks, and heavier antiaircraft guns installed. The yard assembled a catapult amidships and equipped

the vessel to carry three planes. Modernization increased the battleship's displacement by almost 2500 tons, but the ship remained well within treaty limits.[45]

The improvements to Florida cost approximately $3 million. Most of the work was done in the main yard. Completion of the blisters required a large dock, and in February 1926, the ship entered Dry Dock No. 3 at South Boston. By the time the yard finished Florida, work had commenced on Utah. The modernization of the second battleship went more rapidly, and Utah resumed active duty in October 1927.

The work on the two battleships was the most extensive undertaken by the Boston Navy Yard during the 1920s. Initially, both the commandant and the manager hoped the yard would "make a record in this work" for efficiency and economy. The yards at Philadelphia and Norfolk were modernizing the four other battleships, and a comparatively good record by Boston might persuade the Navy Department to increase the repair load for that yard. Manager Simmers seemed satisfied with the yard's performance, although he worried about the extent of the work required at the South Boston Annex, where overhead costs were higher.[46]

Until the end of their careers as battleships in 1931, Florida and Utah continued to be based on Boston. Subsequent to

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45. ARND 1925 (FSS #8600), pp. 45, 79, 82; Commandant to Bureau of Construction and Repair, Jun. 30, 1928, 181-40, Box 41, A9-1; DANFS, vol. II, pp. 418-9; DANFS, vol. VII, pp. 421-1; William E. McMahon, Dreadnought Battleships and Battle Cruisers (Washington, D.C.: University Press of America, 1978), p. 37.

46. Commandant to Manager, Mar. 30, 1925, 181-40, Box 2, A3-1.

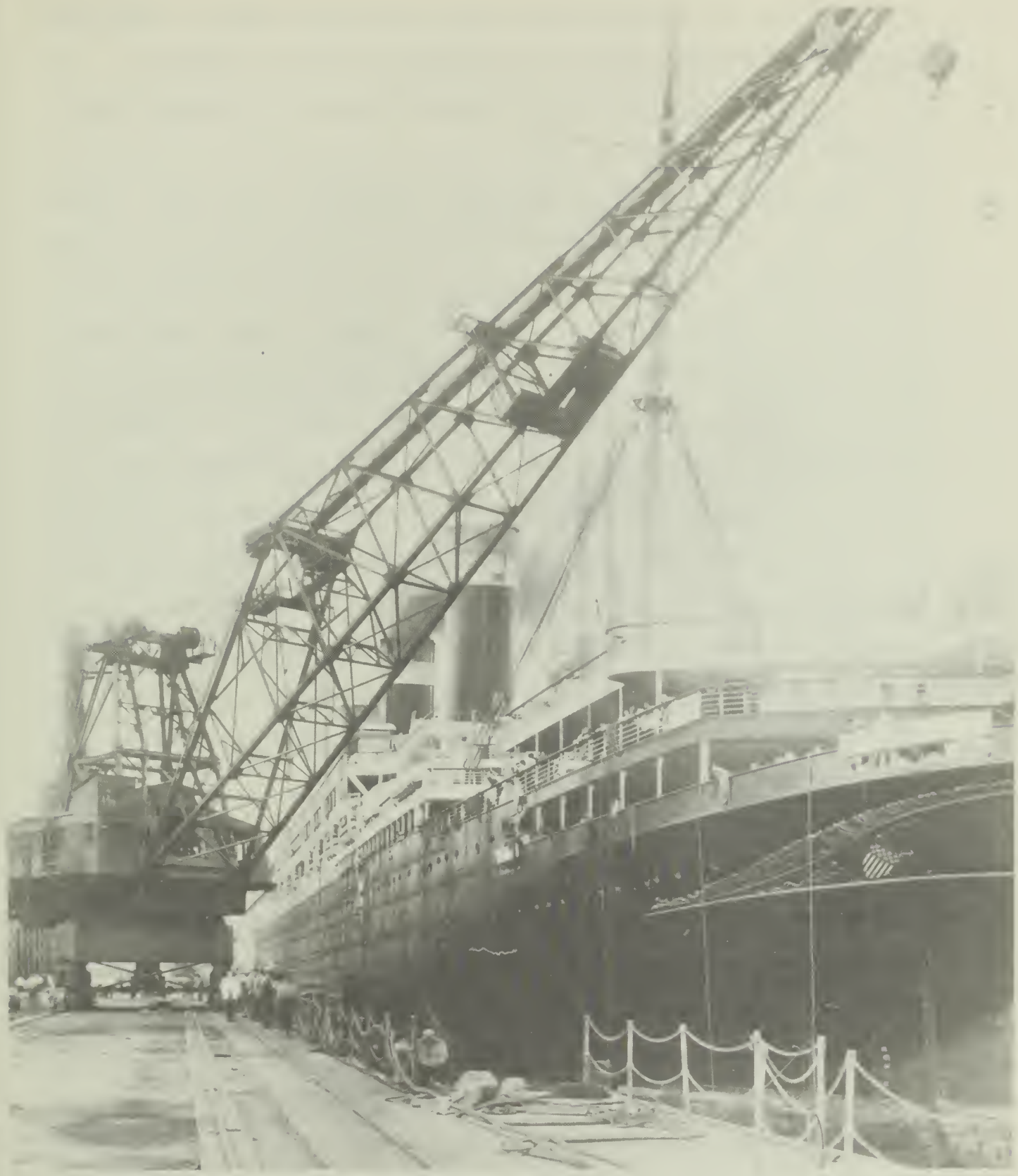
their modernization, the yard made further improvements in their fire control systems.

Another activity of the Boston Navy Yard during the 1920s was related to the naval limitation treaty. That agreement provided that two battle cruisers under construction in 1922 could be converted into aircraft carriers. One of the two was Lexington, being built by the Fore River plant. Although construction began in January 1921, the conversion delayed completion, and the vessel was not commissioned until 1927. The Boston Navy Yard assembled the commissioning stores for the 41,000-ton carrier and its 2100-man crew. Moreover, shortly after it entered commission, Lexington was docked at South Boston for thirty-five days, during which the yard performed alterations amounting to $250,000.[47]

Of all the vessels, naval or otherwise, coming to the Boston Navy Yard for repairs in the 1920s, the most regular were Nantucket and Leviathan. The first, a wooden ship of the Lighthouse Service, annually arrived at the yard, usually in the early spring, for docking, sometimes being hauled out by the marine railway.[48] Much larger and of much greater importance to the yard was Leviathan. Formerly Vaterland, Germany's largest prewar passenger liner, the vessel had been seized by the United States in April 1917 and saw service during World War I as a troop transport. After its last voyage carrying troops, the ship

47. Report of Activities, First Naval District, Jul. 1, 1927-Jun. 30, 1928, 181-40, Box 118, A9-1; DANFS, vol. IV, pp. 104-6.

48. Dry Docking Log 181-60; DANFS, vol. V, p. 10.



PHOTOGRAPH NO. 12: SS Leviathan, in Dry Dock No. 3 at the South Boston Annex, July 7, 1923.

was transferred to the United States Shipping Board. The board converted Leviathan back to a passenger liner and turned it over to the United States Lines, which employed her in the transatlantic passenger service.

The United States Lines made arrangement with the Boston Navy Yard for the semi-annual docking of the ship at the South Boston Annex, Dry Dock No. 3 being one of the few docks capable of receiving the 950-foot, 58,000-ton liner. That arrangement had advantages for both the company and the navy yard. The United States Lines paid less for repairs than at a commercial establishment, since the Navy did not bill the company for tonnage, but charged the same rate as for a naval vessel. The yard secured the additional work in a period of declining activity. Leviathan's dockings usually lasted no longer than a week, but in several instances the yard provided more than cleaning, painting, and other routine hull work incident to docking. In 1923, 1924, and 1927, the ship remained in dock for periods of three or four weeks in length.

Since Leviathan had a schedule to maintain, the arrival of the vessel at South Boston required the yard to shift employees from other work. Manager Simmers noted that Leviathan "generally puts a crimp in us for about a week; that is, we have to take men off other work to push Leviathan through." He hastily added that "of course we are glad to have the work to add to our productive labor." In 1928, Simmers unsuccessfully pleaded with the United States Lines to send the ship to Boston for a five-week overhaul,

instead of having that work done in New York.[49]

In addition to Leviathan, the Boston Navy Yard repaired other passenger liners. The yard lengthened Triumph and converted its propulsion from steam turbine to diesel electric drive. Republic, Majestic, George Washington, and Celtic were liners the yard worked on during the 1920s.

While the fleet of the United States Navy contracted during the 1920s, that of the Coast Guard expanded, partly because of the need to enforce the Eighteenth Amendment. Among its other provisions, that amendment prohibited the importation of intoxicating liquors. Beefing up the Coast Guard to fulfill its Prohibition mission included the transfer from the Navy of numerous World War I destroyers. Between 1922 and 1933, the Boston yard docked forty-one different vessels of the Coast Guard, and throughout the decade the Coast Guard regularly assigned some of its ships to the yard for repairs. In the spring of 1927, that assignment consisted of four cutters, six destroyers, and six 125-foot patrol boats. Usually each ship assigned to the yard was docked twice a year, the dockings lasting only a few days. Nevertheless, the extent of the ship work occasionally led the Coast Guard to station one of its officers at the yard specifically to achieve coordination with the Navy and to handle the administrative details accompanying the servicing of Coast Guard vessels.

The naval appropriations bill of June 1916, which provided

49. Simmers to Capt. Marquart, May 9, 1928, and Simmers to William Perrott, Nov. 22, 1928, both in 181-40, Box 148, OO/Simmers.

for a greatly enlarged fleet, included authorization for the construction of two destroyer tenders. Contracts for those two vessels were signed in late 1919. The Philadelphia Navy Yard obtained one of those contracts and became the lead yard, constructing Dobbin (AD-3). The contract for the other tender, Whitney (AD-4), went to Boston.[50]

Actual work on Whitney began in 1921, the keel being laid in April of that month. Progress suffered somewhat because of the slow delivery of plans from Philadelphia. The launching occurred in October 1923, and the commissioning in September 1924.

Whitney was the largest ship ever built at the Boston Navy Yard, the closest in size being the three fuel ships, under construction in the same period, and LST-1173, completed in the mid-1950s. The destroyer tender had a length of almost 484 feet, a breadth of sixty-one feet, and a draft of slightly more than seventeen feet. Her normal displacement was 10,600 tons, and the modified Thorneycraft boilers and Parson engines gave her a design speed of sixteen knots. Armament consisted of eight 5-inch, four 3-inch, and two 6-pounder guns and two 21-inch torpedo tubes. Dobbin and Whitney were built to provide service, supplies, and repairs for three divisions of destroyers for a two-month period under wartime conditions. To accomplish that mission, both ships had facilities for storing fuel oil, lubricants, fresh water, provisions, and spare parts. Also, each

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50. DANFS, vol. IV, p. 553; vol. VIII, pp. 182-3; Data for Annual Report, Bureau of Construction and Repair, Jul. 12, 1920, 181-39, Box 671, #13; Data for Annual Report, Bureau of Construction and Repair, Jul. 12, 1921, 181-39, Box 752, #13.

had optical and machine shops and other repair capabilities.

After her shakedown cruise, Whitney joined the Atlantic Fleet and replaced Bridgeport, a former German steamer. Converted by the Boston Navy Yard into a repair ship, Bridgeport subsequently became a supply ship and then a tender. With the arrival in the fleet of Whitney, Bridgeport went out of commission at the Boston yard. Whitney served the Atlantic Fleet until 1932. During the remainder of the Thirties, she was with the Pacific Fleet, making brief appearances in the Caribbean to participate in fleet problems. Her World War II experience began on Dec. 7, 1941, when she survived with no damage the Japanese attack on Pearl Harbor. Whitney spent the war years in the central and far Pacific. The ship was removed from the Navy List in 1947 and was subsequently scrapped.

During the 1920s, the Boston Navy Yard became involved with several unusual projects. One was restoration of the historic frigate Constitution. In March 1925, Congress gave its approval for that work and authorized the Secretary of the Navy to accept donations from private parties. Indeed, it was the desire of the Navy to finance the restoration entirely from contributions. Constitution entered Dry Dock No. 1 on June 16, 1927, and remained there until March 15, 1930. Although the yard still had available Dry Dock No. 2 at Charlestown and Dry Dock No. 3 at South Boston, the three-year stay of Constitution in Dry Dock No. 1 serves as a commentary on the volume of conventional ship work coming to the yard. Completion of the renovation was delayed by shortages of workmen skilled in repair of wooden ships, by difficulties in securing special materials, and by the

slow pace with which contributions were received.[51] The restoration cost approximately $750,000.

The Boston Navy Yard served as the base for the abortive rescue and then the salvage of submarine S-4. On December 17, 1927, while surfacing off Provincetown, Massachusetts, S-4 was rammed and sunk by the Coast Guard destroyer Paulding. Divers from rescue vessels exchanged signals with six crewmen trapped in the forward torpedo room, but they could not be saved because of severe weather. S-4 was finally raised on March 17, 1928. The rescue and salvage operations were given top priority by the navy yard, which provided pontoons, other equipment, and technical assistance. After being raised, the submarine was towed to he yard, where she was decommissioned and docked for three weeks. Paulding also came to the yard for repairs of its damaged bow.

The S-4 tragedy stimulated the Navy to devise more efficient submarine rescue techniques. The Boston yard produced a new design for a salvage pontoon, which was of more rugged construction, had greater lift, and was simpler to employ than those used in the S-4 salvage. That salvage had been hampered by the freezing of moisture in the divers' breathing apparatus. Studies at the Boston Navy Yard determined means to avoid that condition and to permit diving operations regardless of temperature.[52]

In the decade after World War I, many of the shops of the

51. Commandant to Bureau, Construction and Repair, Aug. 16, 1929, 181-40, Box 155, A9-1; Commandant to Bureau, Construction and Repair, Sep. 10, 1928, 181-40, Box 118, A9-1; Courier-Gazette, Apr. 3, 1928, 181-40, Box 141, LA.

52. Commandant to Bureau, Construction and Repair, Sep. 10, 1928, 181-40, Box 118, A9-1.

Boston Navy Yard and its chemical and metallurgical laboratories engaged in the quest for the development of new equipment and of new techniques in manufacturing and in the various aspects of ship repair. Most of these efforts resulted from the Navy's conscious campaign to cut costs. The yard was required to inform the Department on a monthly basis of new industrial techniques implemented to achieve greater economic efficiency.[53] Perhaps the most important result of the Boston yard's efforts to develop improved products and techniques occurred in chain making.

In the second half of the 1920s, civilian personnel at the Boston Navy Yard developed a new and superior type of anchor chain known as dielock, which subsequently became standard for ships of the United States Navy. That development restored the yard's chain shop as an important manufacturing activity. Prior to World War I, Boston was the sole source of anchor cable for ships of the line, all ships being equipped with wrought-iron chain. That chain was made from round iron bars, produced by the yard's rolling mill. Chain making consisted of hammering each link and joining them by essentially hand-manufacturing processes, requiring great skill and much labor. Particularly the manufacture of chain in the larger sizes was a tedious and slow procedure, too time-consuming to meet the vastly enlarged demand resulting from America's entrance into the war in 1917. New types of chain appeared, as other Navy activities and commercial

53. For example, see Production Superintendent to Manager, Nov. 5, 1927, 181-40, Box 80, A3-2; Production Superintendent to Manager, Dec. 5, 1927, 181-40, Box 80 A3-1; List of Economies Reported at the Boston Navy Yard, n.d. [1927], 181-40, Box 80 (1927), A3-2.

firms sought to meet the needs of a rapidly expanding fleet. The most important innovation was production of NACO chain, chain cast from alloy steel. NACO proved to be sixty percent stronger than wrought iron and could be manufactured much more rapidly.[54]

The Navy adopted cast steel chain in the larger sizes in 1921, and the chain shop of the Norfolk Navy Yard emerged as the Navy's primary manufacturer of cable. At Boston, the shipsmith shop in Building No. 105 was enlarged by expansion into the west end of the structure, previously used as the Construction and Repair power plant, and new equipment was installed.[55] However, Norfolk-made cast-steel chain threatened the continuation of chain making at Boston. This stimulated experimentation, which led first to the detachable link and ultimately to dielock chain.

As had been the traditional practice in the making of anchor cable, cast-steel chain was manufactured in standard "shots" or lengths. Two pourings were required for each shot, the first for the casting of separate links. Then those links were laid in a series of connecting molds. In the second pouring, the steel flowed around the precast links to form new and connecting links. Cleaning, inspection, smoothing of seams, testing or proofing, and painting produced a finished shot. Numerous shots

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54. This discussion of chain making is based on Paul Ivas, William E. Mullen, and William Palmer, "Development of Die-Lock Chain" (Typescript: Forge Shop, Boston Naval Shipyard, 1950), pp. 8-19. See also "Manufacture of Anchor Chain at the Navy Yard, Boston," BNHP, RG 1, Series 27, Forge Shop.

55. Commandant to Bureau of Construction and Repair, Jul. 12, 1920, 181-40, Box 671, #13; Commandant to Bureau of Construction and repair, Jul. 12, 1921, 181-40, Box 752, #13.

were required to form a single anchor cable, the shots being joined by a connecting shackle or a device known as the Kenter shackle. Both shackles had defects, arising from their shape or construction. In 1921, the quest by Boston's master blacksmith and his leadingman for an improved shackle produced the detachable link, a major step in the development of a new chain.

The detachable link had greater uniformity with common links and thus was more readily accomodated by a ship's wild-cat, hawser pipe, and other equipment involved in the hauling in or letting out of cable. Boston's perfection of the detachable link pointed to the development of mechanically locked anchor chain links. One early attempt involved machining a collar or indented ring on one end of a bar of stock, drilling a socket on the other, bending the stock into the shape of a link, heating the unit, and then locking the socket over the collar with a blow of a steam hammer. This was abandoned in favor of making the link of two separate pieces, one equipped with collars and the other with sockets. Eventually, both halves were dropped forged, the stem or male member having first one and later five collars. Although given the correct size and shape by drop forging, the socket or female member still required drilling. This process became increasingly difficult because of the growing complexity of the stem member, and a production bottleneck resulted. In 1929, the shop manufactured special dies for punching the sockets in the female units, which then could be manufactured as rapidly as the other half of the link.

In 1926, the Boston shipsmith shop manufactured fourteen shots of one-inch chain, each shot being fifteen fathoms in

length. That chain, known as a combination chain, consisted of alternating solid drop forged and drop forged detachable links. This chain was installed on two minesweepers for service tests. In the following year, 430 feet of combination chain in the three-inch size was produced for the Panama Canal Commission to replace the old wrought-iron chain used as an emergency stop for ships passing through the canal's locks. Also in 1927, the shop received authorization to proceed with the development of dies for dielock chain in three-quarter-inch and two-and-one-half-inch sizes.

The development of dielock chain constitutes a major achievement of the Boston Navy Yard during the 1920s. Further work was required to develop the procedures necessary for the manufacture of dielock chain of all sizes on a production bases. That was accomplished in the 1930s

For the nation as a whole, the decade of the twenties ended in calamity, an economic depression unrivaled in American history. During the first several years of the Great Depression, the Boston Navy Yard experienced circumstances already evident in in the 1920s, particularly a decline in industrial activity, a contracting work force, and fears that the facility would be closed.

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North Atlantic Regional Office, National Park Service

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and Preservation District: Report. Shepley, Bulfinch,
Richardson and Abbott, Architects, 1980.

The Archeology of Cape Cod National Seashore. Francis P. 1.00
McManamon and Christopher L. Borstel, 1982. (pamphlet 16 pp.)